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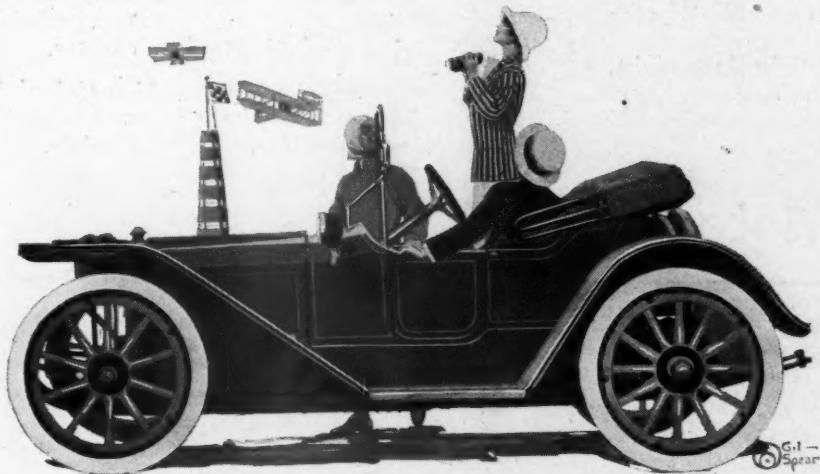
VOLUME XXII

CHICAGO, SEPTEMBER 26, 1912

NUMBER 13

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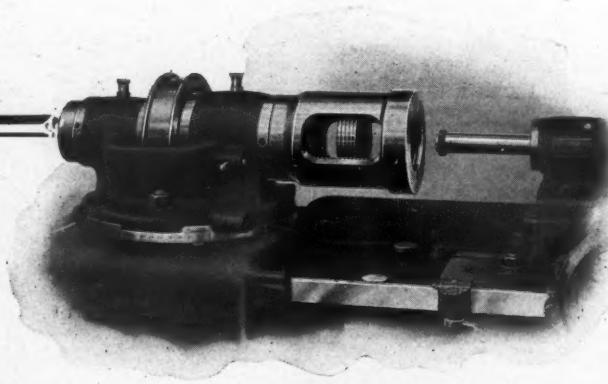
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MOTOR AGE

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September 1, 1912

MOTOR AGE

Firemen's Verdict: "The Horse Must Go"



*Chiefs Attending Convention in Denver
Declare Preference for Motor-
Driven Apparatus*

By Darwin S. Hatch

DENVER, Colo., Sept. 21—"The day of the horse is past in fire department service." These were the words which greeted the visitor many times during the fortieth annual convention of the International Association of Fire Engineers which closed its week's session here yesterday. At least half of the speakers among the fire chiefs used the sentence and it was heard on every hand in the exhibition hall at the Auditorium when the visiting chiefs noticed that of the twenty pieces of fire fighting apparatus shown there was not one that was not motor driven.

That motors far exceeded horses in the points of speed, economy, and ability to get there under adverse weather conditions was the consensus of opinion of the heads of the fire departments gathered from every city of any importance in the United States, Canada, Panama, and the Philippines. According to them it will be a matter of only a few years until all fire departments will be completely motorized.

Motor-driven fire fighting equipment was the almost universal topic of discussion. Of the eleven papers read and discussed at the meetings of the association, five of them dealt with motor-driven equipment, and none was more thoroughly discussed or listened to with greater attention than those on the subject of motors in the fire department service.

Among the papers presented to the convention were papers on Tractors for Steam Fire Engines, Aerial Trucks and Water Towers read by Chief Kenlon, of the New York fire department and R. H. Bawker, chief of the department of Passaic, N. J.; Motor versus Horse-drawn Apparatus in Deep Snows, by Chief Smart, of Calgary, Can.; the Efficiency of the Motor Pumping Engine, by George W. Boothe, chief engineer of the National Board of Fire Underwriters; and the Triple Combination



TYPE OF MOTOR FIRE PUMP AND HOSE WAGON COMBINED. A DOUBLE-PISTON PUMP CARRIED IN FRONT OF RADIATOR

Hose Wagon, Chemical and Pumping Engine, by F. J. Connery, chief of the Newcastle, Pa., fire department.

Motors Now Almost Universal

A canvass of the 550 fire chiefs gathered at Denver showed that practically every municipality of 10,000 inhabitants and over had one or more pieces of motor-driven equipment, and in some towns, notably Savannah, Ga., horses had become an unknown factor in the fire department.

Very few cities are there in which the chief's wagon is not a motor car, and usually the complete motorization of the department is only a matter of time after the advantages of motors over horses are demonstrated to the satisfaction of all by the chief's own vehicle.

Discussion of the advantages of the motor car over the horse-drawn wagon for the use of the chief is hardly necessary. The foremost consideration is the speed with which it enables the head of the department to reach the scene of the fire, have its seriousness gauged, his campaign planned, and be ready to give the necessary orders by the time the apparatus ar-

rives. This is assuming that the motorization of the department has proceeded no farther than the chief's wagon. Where there are other pieces of motorized apparatus, a motor car for the man in command is an absolute necessity, otherwise he would be lagging so far behind his motor apparatus that his usefulness as a field commander is seriously impaired. As to the actual speed, except on the very shortest runs, motorization of the chief's conveyance cuts in half the time required to reach the scene of battle. And this may be taken as generally true, that wherever the horse has been replaced by the motor in fire department service the length of time to reach the fire from the station under average conditions is just about one-half of the time required for a similar piece of apparatus drawn by the four-legged tractor.

What this means to a department at the early stages of fire when seconds mean thousands of dollars, or perhaps even human lives, needs no dilation in the columns of *Motor Age*.

This average figure of twice the speed for the motor apparatus to that obtained

by horse-drawn equipment is only for runs of medium length. In very short runs there is slight advantage in the point of time for the motors, but when the length of run approaches $\frac{1}{2}$ mile or more, the motors gain more noticeably. In the case of very long runs, the motors show the most superiority, for they can maintain any speed for the entire distance, whereas, the horse driver must regulate his speed according to the distance. All in all, the advantage of the motor in the point of speed increases proportionately to the distance covered.

Illuminated Fire Parade

Very forcibly was this phase of the question presented to the chiefs at Denver on the evening of September 18, when an illuminated fire run was made. It concluded the major portion of the motor-driven equipment on display at the Auditorium, as well as most of the horse and motor-driven equipment of the city of Denver. The run was less than 1 mile in length and the motorized equipment sped down the course with an ease that contrasted greatly with the efforts of the straining horses to close up the rapidly widening gap between them and their speedier gasoline and electric rivals. At the finish the motors seemed and were capable of going indefinitely farther at the same rate, but their four-footed followers pulled up panting and blowing, willing, but unable, to pull their heavy loads much farther.

Under average conditions, of load, distance, streets and traffic, horse-drawn equipment can make from 10 to 15 miles per hour, while the motor-driven equipment under corresponding conditions, can average between 20 and 30 miles per hour.

It is when one considers the question of expense as a means of comparison between the two methods of propulsion of fire apparatus that the greatest divergence of opinion is encountered. Fire department



A DEMONSTRATION OF MOTOR FIRE APPARATUS

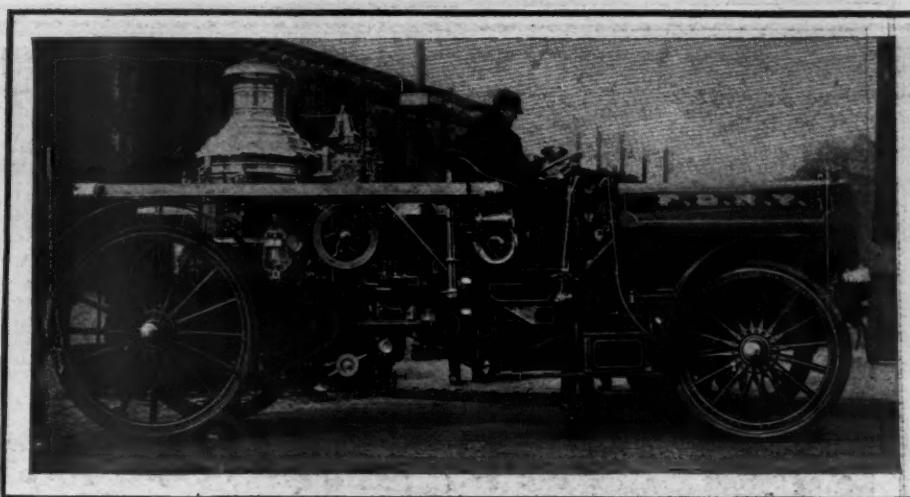
heads, when questioned on the subject, used almost identically the same words in nearly every instance—"There is no comparison."

All agreed that the motor was by far the cheaper to maintain. When pressed for relative costs, their figures varied greatly, but in nearly every case, the divergence was found to be due to one or both of two factors: differences in local conditions, such as the cost of feed, or quality of the streets; or to the length of time the motors upon which the figures were based had been in service. For instance, in the east, where the feed for horses is comparatively high, and the streets are better, the difference in the cost of maintenance of the two types of propulsion is greater than it is in the western states, where feed is cheaper.

Comparative Cost Estimated

Figures for the cost of keeping a horse vary between \$15 and \$25 per month. Chief Kenlon, of New York, finds that the average cost to keep one horse 1 month in the fire department service of that city is approximately \$20 per month. In this statement Chief Bawker, of Passaic, N. J., coincides, as do most of the others. Chief Kennedy, of Billings, Mont., finds that each horse costs him \$17 per month, Chief Post, of Shelby, O., puts the figure at \$19. San Francisco, St. Louis, Chicago, Los Angeles, Cleveland, Cincinnati, Boston, Savannah, New Orleans, Montreal—in fact all of the larger cities expend very close to \$20 a month for each of their horses, so this figure can be taken as a good average.

Cost of maintenance of motor apparatus shows a wide variation. A chemical and hose combination costs the city of Shelby, O., \$2.60 per month for maintenance, including repairs, gasoline, oil, etc. The motor displaces two horses at \$19 per month each or a total of \$38 for the two. This represents a saving of \$35.40 to the city per month, or over 90 per cent. T. F. Ken-



MOTORIZED STEAMER PUMP IN NEW YORK DEPARTMENT

nedy, chief of the Billings, Mont., department finds that a triple combination displacing three horses costs \$10 per month. The horses cost \$17 each, or \$51 total per month, a saving through the motor of \$41 dollars, or better than 80 per cent.

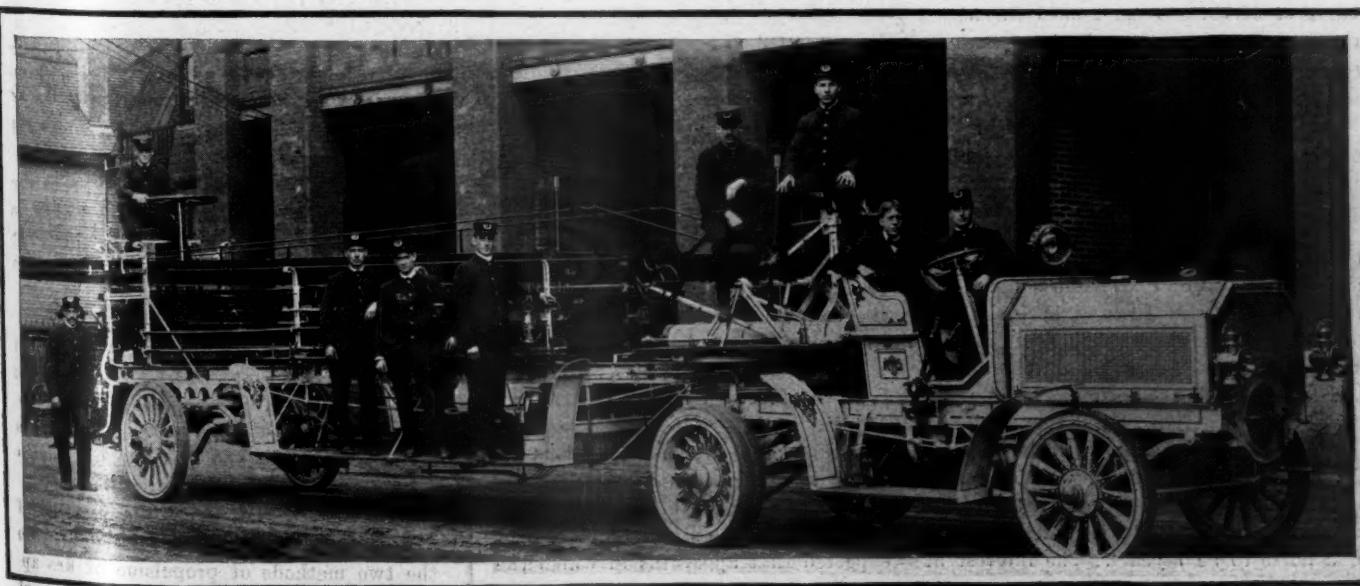
If we consider the cost of upkeep of motorized versus horse companies, instead of the individual pieces, we find an interesting comparison. Norfolk, Va., has both motor and horse companies. The comparison of the upkeep of one of each class of company according to R. T. McLaughlin, chief of the Norfolk department, showed \$42 upkeep of the motor company for a period of 2½ months and for the horse company for the same 2½ months the cost was \$196, or nearly five times as much. The motor company in this case consisted of one motor pump and one combination hose and chemical wagon. The equipment of the horse company consisted of a 4-horse steam pump and one 2-horse combination. In none of the instances referred to has the saving in wages of the men been considered.

Savannah, Ga., a city of about 100,000

population, has effected a saving of \$2,225.78 in 5 months by the use of its motor-driven equipment, according to Chief Ballantyne. This city is completely motorized. It has fourteen pieces, including two chief's cars. The pumps are all gasoline except three which are motorized steamers and are held as reserves. Chief Ballantyne states that the motor pumps save from three to four men, or rather make that many more available as fire-fighters in each company. The driver need not stay with his horses and becomes available as the engineer on the pump, or an actual fire-fighter on the other pieces of apparatus. It is not that men are laid off or wages reduced by the introduction of the motor into the fire department service, but the companies and stations are strengthened by reducing the number of men actually needed to operate the apparatus so that they can be used for other purposes.

One Phase of Motorization

Very naturally, one of the first developments in the way of the motorization of fire departments was the actual substitu-



AERIAL LADDER TRUCK DRIVEN AND OPERATED BY A MOTOR



A 1,000-GALLON MOTOR-DRIVEN THREE-STAGE TURBINE PUMP

tion of a gasoline tractor instead of the horses, hitching the tractor to the same machine as the horses had formerly pulled. This method of motorization has been very successful, particularly with such heavy pieces as steam pumps, aerial ladders and water towers. New York is perhaps the leader in this method of motorizing, although some other towns are employing it. Passaic, N. J., is one of these, and the chief of its fire department, R. H. Bawker, is authority for the statement that the cost of hauling the apparatus so equipped was one-tenth of the cost of hauling the same apparatus with horses.

Chief Bawker states two tractors were purchased at the beginning of the year 1910 for pulling the hook and ladders. One is a 90-horsepower tractor which pulls an aerial truck having a 75-foot extension ladder and weighs 10 tons; the other is an 80-horsepower tractor pulling an ordinary city-size truck. During the year ending May 30, 1912, the two tractors averaged a cost of \$8.85 per month, against the cost of \$190.10 per month for horses on the same apparatus. These figures include gasoline, oil, and repairs of every description to the tractors, and the figures for the horses include feeding and shoeing, repairs to harness and veterinary fees.

New York's Inclinations

New York leans to the use of the tractor-pulled steamer rather than to the true motor pump. Chief Kenlon's figures as to the economy of tractors in New York brought out a more comprehensive method of comparing the economy of the animal and mechanical propulsion. Kenlon believes that to arrive at the true basis, interest on the investment, depreciation, etc., should be considered along with the other costs. He assumes the life of a tractor in his department to be 12 years and the life of a horse to be 7 years. The interest at 4 per cent on an investment of \$4,000 for a tractor is \$160 and the depreciation in

value amounts to \$333. Similarly, the interest on the three horses at \$350 each displaced by the tractor is \$36.75 and their depreciation \$150.

Of even more importance than economy is the question of reliability. Can motor apparatus be depended upon to be on the job when needed? The opinion seems to be very general among fire engineers that it can. So far as the tractors are concerned, there seems to be no doubt. Chief Kenlon states that during the 6 months ending August 19, a motor-drawn steam fire engine has answered upwards of 500 calls, and in no case has it failed to reach the fire, in most cases in better time than the horses. On the strength of this performance the city of New York has just let the contract for twenty-eight tractors. Sixty-one new companies are being organized fully motorized. Instead of stables the stations are garages.

In illustrating the dependability of the tractors in the Passaic service, Chief Bawker stated that during the 18 months in which they have been pulling the trucks, there has not been a time when the alarm has sounded that there has been trouble in starting, and when started the tractors have always arrived at and returned from the fire without trouble or delay. There are some very steep hills in the city of Passaic but the tractors make 8 miles an hour on the steepest of them.

In the winter season when snow and ice cover the streets, it does not interfere to any great extent with the operation of the tractors. In one instance, Chief Bawker states, it snowed continuously for 24 hours when an alarm was turned in from the hill section of the city. A speed of 15 miles an hour was made through streets unbroken by traffic. The best horses could have done under similar circumstances would have been 5 miles per hour.

With tractors doing so well it is to be expected that apparatus in which the motor is on the same truck would do as well or better in snow and ice, for in the

latter type the weight is on the driving wheels, where it should be to give traction. Such is the case, as the experiences of the departments which have used them in snow will show.

Kansas City's Preference

According to George C. Hale, fire and water commissioner of Kansas City, Mo., a motor-driven, three-way combination got to a fire and handled it through 26 inches of snow when all the horse-drawn equipment became irretrievably stuck. With chains on all four wheels and the load helping to give traction these motor-driven pieces can go through storms that horses cannot face.

For experiences in snow, most would imagine Calgary, Can., to be the city offering the most rigorous conditions, but James A. Smart, chief of Calgary's fire department, says that the snowfall is not great, but very dry and often drifts to a depth of 2 or 3 feet. He has had in use for the past three winters a 40-horsepower squad wagon and during that period never has been tied up, never failed to reach a fire under any weather conditions. He believes that motor-driven apparatus has the advantage over horse-drawn apparatus wherever the use of wheels is possible. Only in the use of runners has the horse-drawn apparatus the questionable advantage, for in severe storms horses will not face the average blizzard of the northwest, and the motor will. Under light, flaky snow, Chief Smart says, he has seen 75 per cent of the horses fail in attempting to reach a fire on asphalt pavement up a slight grade that the motors negotiated without difficulty. The Society for the Prevention of Cruelty to Animals never had a spasm at seeing a motor standing facing a blizzard.

There is not the unanimity of opinion in regard to the availability of the gasoline motor as a pumping engine that there is as to its advantages as a propelling unit. Motor pumps as distinguished from steamers have not yet proven their entire reliability to the complete satisfaction of many fire engineers, who hold that though the gasoline engine is the best method of getting the pump to the fire, the steamer is the better for doing the pumping. One of the reasons advanced by the adherents of the steamer as a pump in conjunction with the motor as the propeller, is that it is asking too much of the gasoline engine in its present state of imperfection, to expect entire reliability for hours of steady work at top load after it has been pushed to get the pump there in the shortest possible time.

Looking After Motor Pumps

Adherents of the motor pump say that if the motor is looked after and operated by a competent man, and by that man alone, there need be no fear of premature exhaustion of the motor from overwork. In support of this contention, Chief Magee, of Dallas, Tex., who allows but one man to look after his motor pump and



ONE OF THE LATEST TYPES OF FIRE PUMPS CARRYING ITS OWN HOSE

permits no one else to lift the hood, mentions one long stretch of work which proved the reliability of the motor pump to his satisfaction. After getting the pump to the fire in record time the motor pumped water for three lines of hose for 17½ hours and for one line of hose for three hours longer. The operators of the Dallas motor pumps number three to each pump and work on three shifts. One of these is called the chief engineer and gets \$10 more per month than do the other two drivers. He has complete charge of the motor and no one else is permitted to raise the hood.

The man must know his motor. As Chief Ballantyne puts it, "You can't put a figurehead up on the driver's seat and expect reliability." Motors are not fool-proof yet. The man must recognize knocks and not try to adjust the carburetor when the motor grunts from the cold water running through its jackets.

Ballantyne tells of a fire in the cotton storehouses along Savannah's waterfront. It was necessary to put seven motor pumps in hubdeep on new-made ground where horses never could go. With these he

pumped twenty-one streams for 8½ hours and three for 13 hours without the least sign of trouble. Each of the seven pumps ran at top speed continuously.

Objection Against Motor Pump

Another objection urged against the motor pump is the fact that with the present arrangements their exhaust gases cannot be used to thaw out frozen hydrants, as is done with live steam from the boiler of the steamer. In answer to this, those who uphold the motor pump say that when the proper hydrants are properly installed and looked after, they will not freeze. Nevertheless, hydrants do freeze, and some means must be provided to thaw them out. Chief Kenlon urges the use of electricity in the same way as it is employed on water pipes and even suggests that the motor pumps carry with them an arrangement of some sort for utilizing the power lines and lighting mains. Chief Ringer, of Minneapolis, states that alcohol in the quantity of about 1 pint thaws the hydrants in short time. Means for thawing hydrants with motor pumps is a question that the makers will have to solve.

There is another point in which motor

pumps of some types, at least, are weak, although makers are waking up to the fact. As pointed out by George W. Booth, chief engineer of the committee on fire prevention of the National Board of Fire Underwriters, in his paper presented last week on the efficiency of the motor pumping engine, the chief reasons for the breakdown of motor pumps during service is the continued running at high speed. It is the opinion of all the engineers who have observed tests of motor pumping engines, that these machines should be provided with high powered motors, so that it will not be necessary to run them when the pumps are delivering their maximum capacity, at a speed greater than is safe and reasonable for the long continued service which they are often called upon to perform.

Booth believes that a reasonable and reliable speed will be not much in excess of 1,000 feet per minute piston travel as assumed in the A. L. A. M. formula. It was found that interruptions and breakdowns were most often due to running the motor high speed. There is a growing tendency among manufacturers of motor fire engines towards these high-powered motors, since they decrease the liability of heating or other engine troubles, and of vibration and consequent breaking of small parts.

Interesting Exhibits

So far as the exhibits of apparatus were concerned, most interest perhaps was created by the monster Gorham pump recently produced by the Seagrave Co., Columbus, O. It is a motor-driven multiple-stage centrifugal turbine-type pump and is made in two sizes. The larger has a normal capacity of 1,000 gallons per minute, and the smaller of 750 gallons per minute.

The apparatus consists of a heavy chassis carrying a six-cylinder gasoline engine of 7½ inches bore and 9 inches stroke at the forward end with its shaft extending to the rear end, where it is connected to the rotor shaft of the turbine pump. The latter is mounted on ball bearings and



OFFICIAL TESTS OF MOTOR PUMPS AT DENVER



COMBINATION CHEMICAL AND HOSE WAGON ANSWERING ALARM

carries rotor wheels, on which are mounted the vanes or blades that revolve inside the outer casing. There are three of these rotor wheels or runners.

As this pump will take and deliver gravel the size of a walnut without chance of injury to itself, no precautions need be taken as to the water supply and the only moving parts inside the pump are the three runners and drive shaft. It is possible to shut off any or all leads of hose from the pump, either together or separately, without the use of relief valve or any danger of killing the engine. Connected to the pump is a water governor, which throttles the engine automatically, thus allowing the pump to meet with the varying conditions of fire service without material change in pump pressures. The motor is a T-head construction of the slow-speed type, rated by the A. L. A. M. standard formula at 144 horsepower. It delivers its maximum horsepower at 750 revolutions per minute. Ignition is by a Bosch two-spark system, thus exploding in each cylinder from two independent spark plugs at the same instant. There is a third set of spark plugs connected with the battery and Bosch coil for use in starting.

The motor is fitted with a self-starter. The oiling system is self-contained and provides for force-feed oiling to all cylinders and bearings. The frame is of 7-inch channel steel. Tires are solid, 40 by 5 inches in front and 40 by 4 inches dual in the rear. The wheelbase is 174 inches and the truck can carry seven men at a speed of 35 miles per hour. Either machine can be supplied with a body for carrying 1,000 to 2,000 feet of 2½-inch fire hose, if desired.

Another engine of large size is the Robinson Monarch. The engine is six-cylinder, 6½-inch bore and 6¾-inch stroke; rating by A. L. A. M. rule 93.6 horsepower. The pump is reciprocating, three plunger, single-acting; 6-inch bore and 8-inch stroke and rated at 900 gallons per minute at 120 pounds net pump pressure and 500 gallons at 200 pounds pump pressure. One of the American-La France pumping engines was a six-cylinder, 7½-inch bore and 8-inch stroke; rating by A. L. A. M. rule 121.6 horsepower. The pump is of the rotary-gear type, rated at 900 gallons per minute at 120 pounds net pump pressure, and 600 gallons at 200 pounds pump pressure.

A large Webb engine was shown. This engine is six-cylinder, 6-inch bore and 7-inch stroke; rating by A. L. A. M. rule 86.4. Pump is of the rotary type, rated at 800 gallons per minute at 120 pounds net pump pressure. The Ahrens-Fox Continental engine is a six-cylinder, 5½-inch bore and 6½-inch stroke; rating by A. L. A. M. rule 72.6 horsepower. The pump is reciprocating, duplex, double-acting; 6½-inch bore and 4-inch stroke. Rated at 600 gallons per minute at 120 pounds net pump pressure, and 350 gallons at 200 pounds net pump pressure.

Milwaukee Meet Postponed

Rain Puts Wauwatosa Course in Such Condition Vanderbilt, Grand Prix and Small-Car Races Cannot be Run—New Dates Chosen by the Brewers Are October 2, 3 and 5

MILWAUKEE, Wis., Sept. 23—No road races were run over the Wauwatosa course last week because of the horrible condition of the circuit that had been prepared for the Vanderbilt, Pabst, Wisconsin and grand prix events. Equinoctial rains made a sponge out of the roads and in consequence all four events have been postponed for 10 days, in order that the course may be put into condition for the classics. The new schedule calls for the running of the Vanderbilt on October 2, the small-car events on October 3 and the grand prix on October 5.

It was a most disappointing ending to what promised to be a glorious success. The stage had been set for the big races and had it not been for the rain there would have been no hitch. There had been a fine advance sale of tickets, the leading drivers and the fastest cars had been nominated and the motoring audience had settled back in anticipation of keen sport. But Thursday, the day before the meet was to open, it started to rain and the water came down so hard that it was impossible to have practice. That night it cleared off nicely and everything looked lovely. At 6 o'clock Friday morning there came a small cloudburst, which practically put the course out of condition.

Still the Milwaukeeans wanted to go ahead with the program and as it was not raining at the time scheduled for the decks to be cleared for action, it was determined to attempt the running of the small-car event a couple of hours later than the hour first selected. But just as the cars were lined up at the tape at 1:30 there came another shower. Referee Parlington inspected the course, then postponed the Pabst and Wisconsin to September 24. It was announced that an attempt would be made to run the Vanderbilt the next day, Saturday, it being anticipated that the weather would clear and give the roads a chance to dry out, so work could be done.

The next morning, however, the early birds discovered it was raining again. It was a mean sort of a drizzle and it looked as if it never would stop. It didn't take long for the referee to call off all bets and proceedings were stopped at 10 o'clock in the morning. Meetings were called for the afternoon to decide what to do—whether to try to race this week or postpone. First the dealers who are promoting the meet got together and decided to run the races even if they had to wait a month for fine weather. It was left to the drivers, however, to select the

dates. The pilots wasted no time in their deliberations. They were all agreed to stick by Milwaukee to the finish and suggested the dates mentioned above, which choice was concurred in by the dealers' association.

The dealers then told the drivers that they would pay the expenses of the racing teams during the intermission. If any of the drivers wished to go home, then they would pay for the transportation. Everything was most harmonious and everyone expressed a willingness to work for the success of the meet.

A new plan of action was decided upon—to take in other interests outside of the Milwaukee Automobile Dealers' Association, which so far has carried the entire burden. Co-operation of others will be sought. The Milwaukee Automobile Club will be asked to help; so will the local chamber of commerce and other big organizations. By getting everyone helping it is anticipated the meet can be made a huge success, notwithstanding the postponement.

No time has been lost in getting to work on the course. If the weather remains as it is now—cool and sunny—there will be little difficulty experienced in making the circuit safe and fast. As it was last week, though, it would have been suicidal to have attempted to have run the meet. The affair was not postponed because of the rain itself, but because the course was not in condition to shed the rain that did come down. Had it been the Elgin or Santa Monica course the rain would have had no effect whatsoever on the circuit and it would have been possible to have run off the races despite the downpour.

Entries will be reopened, of course, and it is anticipated that there will be a few more nominations. It is expected that E. E. Hewlett will put in a fourth Fiat and there is a possibility that it will be driven by Howard Wilcox. Harry Stutz also desires representation in the grand prix and it is said he will make an entry in that event.

SUNBEAM TRAVELS FAST

London, Sept. 14—D. Resta, in a 30 horsepower six-cylinder Sunbeam, attacked the 1, 2, and 3-hour records at Brooklands last Monday, and, while he was stopped at 50 miles by a broken gasoline feed line, he managed to travel the half century in 32 minutes 16.4 seconds from a standing start, an average of 92.96 miles per hour, as against the 50-mile record of 91.32 miles per hour.

Cream City Backing Races

Milwaukee's Mayor Brings Business Interests Together and it Is Decided to Back Up Dealers in Promotion of Road Classics—Sunshine Puts Course in Shape—Practice Friday

MILWAUKEE, Wis., Sept. 25—The Milwaukee Automobile Dealers' Association has no further cause to fear that bugbear, financial loss, on the first running of the international road races at Milwaukee next week. Enough admissions and reserved seats were sold at the mayor's conference in the city hall on Tuesday afternoon at 4 o'clock to insure the financial success of the postponed cup races—and this means that the Vanderbilt cup, grand prix, Pabst and Wisconsin challenge races will be held in Milwaukee in 1913.

Of his own volition Mayor Gerard A. Bading called the conference "for the good of Milwaukee" in relation to the cup races. A committee consisting of the principal officers of all organizations interested in the progress and development of the city went into the matter with the mayor and before adjournment pledged enough seat purchases to make the outlook more rosy than it has ever been. The twenty-two members of the M. A. D. A. were present. All sympathy stuff was cut out and the watchword was support.

The wind-up of the booster campaign, by means of which Milwaukee will very easily take care of the financial part of the carnival, in case the outside world throws the city down, will be a monster stag at the Milwaukee Automobile Club on Monday evening, September 30.

Four days of sunshine and moderately warm weather have not only made that part of the course which was only slightly affected by the heavy rains wonderfully hard and smooth, but has helped the work of repairing washouts. Practice will begin all over again on Friday.

KLINEKARS WIN AT PITTSBURGH

Pittsburgh, Pa., Sept. 21—The Burman string performed here this afternoon at Brunots' Island track. Burman, in the Jumbo Benz, turned a mile in :51.98, cutting the Oldfield mark of :52.80. Horan, in the Cutting, plunged through the fence in the fourth event, caused by the dust which prevented him seeing the turn. Outside of these incidents the feature of the afternoon was the performance of the Klinekars, which won five of the races, which included two defeats of Burman in an Ohio. Summaries:

Five miles, 300 inches and under, non-stock—Raimey, Ohio, won; Kerr, Klinekar, second; Ringler, Mercer, third. Time, 5:02.82.

Five miles, 231-300 class, non-stock—Minter, Klinekar, won; Raimey, Ohio, second; Ringler, Mercer, third. Time, 4:58.06.

Five miles, 600 inches and under—Minter, Klinekar, won; Burman, Ohio, second.

Three miles, best two in three heats, free-for-all. First heat—Burman, Benz, won; Fetterman, Simplex, second; Ringler, Mercer, third. Time, 2:59.85. Second and final heat—Burman, won; Fetterman, second; Ringler

third. Time, 3:09.95. Exhibition mile—Burman, Benz. Time, :51.98.

Three miles, free-for-all, Remy brassard—Kerr, Kline, won; Burman, Ohio, second; Shafer, Mercer, third.

Three miles, special event—Kerr, Klinekar, won; Shafer, Mercer, second; Minter, Klinekar, third. Time, 3:08.80.

Five miles, free-for-all, handicap—Kerr, Klinekar, won; Burman, Ohio, second; Raimey, Ohio, third.

NEW OIL CORPORATION

New York, Sept. 25—Financial interests back of the Mexican Petroleum Co. have announced that they are behind the organization of a new corporation with \$35,000,000 capitalization, which will be known as the California Petroleum Corporation. The first object of the new company will be to acquire control of at least 80 per cent of the stock of the American Petroleum Co. and the American Oil Fields Co. This would give the new company 19,000 acres of land, about one-fifth of which is producing and which has been estimated to contain 295,000,000 barrels.

MILWAUKEE PLANT FOR KISSEL

Hartford, Wis., Sept. 25—The Kissel Motor Car Co. has acquired an additional plant at Milwaukee, securing 200,000 square feet of floor space. This means it will double the output. The general offices will move to Milwaukee. It is said the plant will be in the former Romadka trunk works.

FRENCH TALKING CAR TARIFF

New York, Sept. 25—Special telegram—Following the agitation in England about the invasion of the American small car, which has led to talk of the formation of a corporation with a capitalization of \$25,000,000 to build lines to compete with the American motor cars, the French manufacturers are also becoming stirred up. The Frenchmen point out that their local market for cars listed at \$1,000 is dead as the result of the American invasion. Both countries are to be protected from the dreaded American car by a tariff wall, if the wishes of the agitators are followed. The general opinion of American manufacturers is that no big competitive companies will be formed and that the preferential tariff talk will end in nothing.

Symptoms of panic which marked the British industry last week on account of the invasion of the British market by low-priced American cars, have subsided to a certain extent after a view of the situation from the standpoint of sober second-thought.

According to the cabled news from London nothing further has developed as regards the formation of a \$25,000,000 cor-

poration to make cars to sell at from \$1,000 to \$1,250, in competition with American lines of somewhat similar price. The idea, according to the distinguished speakers, including the Duke of Westminster and Lord Montagu, was that while the company probably could not equal the American cars of the same class on an even price footing, that the government might be prevailed upon to impose a preferential tariff against the American cars to cover the difference in price between the new British lines and the regular product of the American factories.

THOMAS RECEIVERS APPOINTED

Buffalo, N. Y., Sept. 23—Formal notification to the creditors of the E. R. Thomas Motor Car Co. has been issued that George C. Finley and Adolph Rebadow have been named receivers. A preliminary survey of the properties shows that while the nominal assets are in excess of the indicated liabilities, a severe shrinkage will be experienced in converting the assets into money. The liabilities are now estimated at \$1,100,000.

CRUDE RUBBER EASIER

New York, Sept. 25—Special Telegram—Crude rubber was easier in the world's markets after the results of the first day's sales at the fortnightly auction in London were made known. The total offerings were 840 tons, and 292 tons changed hands at prices ranging from $\frac{1}{2}$ to 1 cent lower on a basis of \$1.16 $\frac{1}{2}$ for pale crepe. Upriver fine sagged off to \$1.12 in the New York market. Buyers are still holding aloof.

UNCLE SAM WANTS STANDARD CARS

Washington, D. C., Sept. 25—Special telegram—Specifications for a standard motor car for use throughout the government service will be issued in a few days by the general supply committee of the departments. The committee is working on these specifications and will have them ready for the trade probably within the next few days. These specifications do not contemplate the building of a purely governmental machine, but will provide a standard that must be met before purchases are made by the departments. It is the idea of the committee to embody many of the best features of standard makes of cars and to establish a rigid rule for the efficiency and lasting powers of parts.

GLIDDEN START POSTPONED

New York, Sept. 25—Special telegram On account of slowness in receiving entries for the national reliability tour of the American Automobile Association, the date of the start for the tour has been postponed until October 14, a week later than the original date. Announcement has been made by the A. A. A. that the reason for the slowness referred to is that many owners wished to compete with 1913 models and that deliveries of such have been slow.

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The Owner's Protection

THE car owner who has to have repair work done at an unknown garage or at some repairshop with which he has not previously had dealings cannot do better than give written instructions regarding the work to be done and demand a written reply covering an estimate of the work and the time it will require. Doing it in this way is simply good business practice, a practice that saves money, saves time and often saves the car to an amazing extent. It is only when you have given oral instructions over the telephone without a witness, and received oral replies over the telephone, also without a witness, and when you later find a bill for several hundred dollars where you imagined the cost would be \$25, that you realize the necessity for caution in this respect.

UNFORTUNATELY there are many garagemen and many repair men with incompetent help, who are prone to overestimate the amount of work that must be done in overhauling a car, and who have the faculty of taking off the body to change the carburetor or scrape the breaker points on the magneto breaker box. From all parts of the country come complaints of similar apparently unjust treatment of unscrupulous garagemen—garagemen who in not a few cases should be prohibited from conducting businesses because of the absolute lack of dependence that can be placed on their words and on their work. So glaring have these abuses become in certain parts of the country that clubs and trade associations have taken up the matter and have started a commendable movement of reform among the more hopeless section of them. There is room for much more to be done.

THE car owner needs more protection against the incompetent garageman and repairman. He specially needs protection against inadequate repair work. Not infrequently a car of one make has developed certain troubles, the owner cannot diagnose them, and leaves the situation in the hands of the garageman or the repairman. The latter takes advantage of the owner's ignorance or perhaps is equally incompetent to do the work or diagnose the trouble. In the end the owner pays for it in dollars and cents. He pays for a large repair bill and often his car is returned to him in an untuned or mechanically upset condition. The repairman has been an amateur of the amateurs. He has been a novice who had not any right to be permitted to experiment upon the car.

THE solution of this grievance rests with the car makers and with the motoring organizations. In England the matter has been largely settled by the Automobile Association and the Royal Automobile Club, which organizations issue certificates of qualification to repair shops and garages and furnish them with official cards which can be hung on the wall or mounted in other official and conspicuous positions. These cards certify to the general status of the garage and have riders which apply in particular to the repair force. If the National Association of Automobile Manufacturers, the Automobile Board of Trade or some national dealers' or garagemen's organization would take hold of a matter of this nature and demand competency of repair help, it would be one of the most savory factors that could possibly enter the garage and repairshop field. It would bring more business to the competent repair department and the adequate garage repair department and it would be cheaper to the car owner and more satisfactory to the car maker.

THE attaining of adequate repair work throughout the country can further be assisted by car makers issuing to all garages special instruction books showing the correct methods of dismounting car parts and also outlining what parts it is necessary to remove in order to dismount a certain portion, as well as noting what parts it is not necessary to remove before doing such a work. Repair bills can be produced to show vast amount of time charged up as labor for removing car parts that never should have been removed in order to repair the necessary break. This is where the car owner is taxed for the ignorance of the garage man, his help or the repairman and his help.

IT is of interest to the car maker to protect his owners. He can do it by working to get some method of controlling the working forces throughout the garages and repairshops of the country; he can aid by instruction books on dismounting of car parts; he can help by instruction books on treatment necessary for different metals; and he can do it in a score of other ways. Those makers who have erected service buildings are doing a wonderful good to those owners in their locality, but it is of little benefit to the owners in sections not within the zone of the service building. There is not any reason why the maker cannot extend his influence to this uncovered field. The need is great.

Motor Fire-Fighting Apparatus

TO a certain extent the rapid advance in the use of motors for fire department apparatus has been due to the inherent advantages of the motor as a source of power rather than to the farsightedness with which it has been applied by the makers. The manufacturers of motor-driven equipment for fire department service have not always followed the wisest course in the selection and arrangement of the component parts of the apparatus. Motors, chassis and frames originally designed for commercial truck service and often for pleasure cars have been adapted as far as possible to carrying the various pieces of equipment in fire service—in many cases seemingly without sufficient thought as to the wide difference in conditions of service and requirements in the fire department field and that for which the units were originally designed. The fact that it has only been with the past year or so that motors have become gen-

erally adopted as a means of propulsion in this service has been due, no doubt, to the fact that early designs of trucks for fire departments were produced without sufficient knowledge of the service to be required of them.

MOTORS for operating fire pumps must be capable of continuous service for hours at a stretch. The chief difficulty found with this class of equipment at the present time is that the motors as a rule are designed for delivering their normal power at too high crankshaft speed. Slow-speed motors show longer life, greater dependability and more continuous service than do high-speed motors. This fault is one which may perhaps be laid to too little consideration of the differences between the pleasure car and fire department requirements.

Indianapolis Announces a 2-Day Meet

INDIANAPOLIS, Ind., Sept. 25—C. W. Sedwick, manager of the Indianapolis speedway, announces a 2-day meet will be held May 30 and 31. This will be a long race the first day, in all probability 500 miles, with a card of shorter races the second day. For the long race the piston displacement will be fixed at a maximum of 450 cubic inches and the minimum weight at 1,600 pounds.

Entries will open January 1 and close May 1, and the entry fee for the long race will be \$500. The purse has not been determined. The second day probably will include the Wheeler & Schebler trophy, the Prest-O-Lite trophy or the Remy

Annual 500-Mile Race Will be Limited to 450-Inches and Under Cars

brassard. For the long race cars must attain a minimum of 75 miles per hour.

JOE DAWSON REINSTATED

New York, Sept. 25—Special telegram—At the September meeting of the contest board of the American Automobile Association yesterday Joe Dawson, winner of the 500-mile Indianapolis speedway race, who was automatically disqualified as a registered driver for giving an exhibition

at an unsanctioned meet at Memphis July 4, was reinstated to take effect at once, as was his manager, C. E. Shuart. Fred Radina, a Cino driver, also was reinstated.

Applications for reinstatement from the Schact Motor Car Co. of Hugh B. Andrews and T. S. Duby were rejected. The Cleveland agency of the Stutz was disqualified until January 1, 1913, for advertising the Stutz performance at Elgin as a stock car, when these races were non-stock. The records of Spencer Wishart in the 200-mile race at Columbus were accepted; the recent Brighton Beach and Cleveland records were also accepted by the board.

September 25-October 6—Agricultural exhibition and Plowing Matches, Bourges.
 September 30-October 5—American Road Congress; Atlantic City.
 September—Track meet; Universal Exposition Co., St. Louis, Mo.
 September 25-October 6—Agricultural exhibition and plowing matches, Bourges.
 *October 2—Vanderbilt road race; Milwaukee, Wis.
 *October 3—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
 October 4-5—Track meet; Sioux City Auto Club, Sioux City, Iowa.
 October 5—Grand prix; Milwaukee, Wis.
 October 5—Fifth annual run of St. Louis Automobile Club; St. Louis, Mo.
 October 6—Galion hill climb.
 October 7—Start of Iowa State Automobile Association's reliability.
 October 8—National convention of Electric Vehicle Association of America; Boston Mass.
 October 12—Track meet; Rockingham park, Salem, N. H.
 *October 14—National tour Detroit to New Orleans; American Automobile Association.
 October 21—Chicago Motor Club reliability.

Coming Motor Events

October 26—Los Angeles to Phoenix Road Race.
 November 2-3—Splash guard competition; Versailles.
 November 6—Track meet; Shreveport Automobile Club, Shreveport, La.
 *Sanctioned by A. A. A.
 SHOWS.
 September 23-Oct. 3—Rubber show, Grand Central palace, New York.
 September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
 October 2-12—Fire show, Madison Square Garden, New York.
 October 7-12—St. Louis show.
 November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.

December 7-22—Paris salon.
 January 6-11, 1913—Cleveland show.
 January 4-11—Montreal show.
 January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
 January 11-22—Brussels, Belgium, show, Centenary Palace.
 January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
 January 20-25—Philadelphia show.
 January 25-February 1—Montreal, Canada, show.
 January 27-February 1—Detroit show.
 February 1-March 1—Pleasure car and truck show, Cincinnati, O.
 February 1-8—Chicago show.
 February 10-15—Chicago Truck show.
 February 10-15—Minneapolis show.
 February 17-22—Kansas City show.
 February 24-March 1—Show at Omaha, Neb.
 March 3-8—Pittsburgh show.
 March 8-15—Boston pleasure car show.
 March 17-22—Buffalo show.
 March 19-29—Boston truck show.
 March 24-29—Indianapolis show.

Antecedents of Words Now Part of Motor Phraseology



Trail-Blazers Encounter Adventures



CHICAGO PATHFINDERS ON STRETCH FROM CHICAGO TO ESCANABA, MICH.

CHICAGO, Sept. 25—The sensational reliability run of the Chicago Motor Club, which proposes to encircle Lake Michigan, starting October 21 is attracting the attention of the western motor-ing public because of the boldness of the enterprise and the difficulties that are be-ing encountered by the pathfinding Velie which is out under the direction of John G. De Long. The car has been out 11 days now and last night it was reported at Traverse City, Mich. It ought to reach Chicago to-morrow. De Long and his party were held up at a little town called Gar-den, Mich., awaiting new parts, pinions on the differential gear being broken in a battle with sand caused by getting off the regular trail.

At this particular point it is almost wild country, the road winding through picturesque woods. The going is none too good but still negotiable, while the country penetrated abounds in wild animals. The pathfinders had a thrilling time of it. After getting out of the sand pocket it was necessary to abandon the car and walk 10 miles through darkness. They lost the way and laid down to sleep in the woods. A rain awoke them and they resumed their journey, finally finding a logger's cabin where they slept the rest of the night. On their tramp they heard bears and wolves in the underbrush and it was necessary to fire their guns to scare away the animals.

While all this may sound terrifying to would-be contestants, it is pointed out that the adventure will be well worth the while. It is anticipated there will not be more than 2 days hard going, that from Escanaba to St. Ignace. It is a country that should be alive to motoring following the reliability. At any rate makers are showing a keen interest in the affair and already there are nominated

Chicagoans, Lost in Woods, Hear Wolves and Bears —Battle With Sand

two Velies, two Stutzes, a Chalmers, Falc-
car, and Detroiter, while promises have
been had from the Moline, Staver, Cino,
R. C. H., Herreshoff, Hupmobile, Flanders,
Studebaker, Kisselkar, Case, Cole, and
others which ought to produce a field of
at least thirty starters. The two Cadil-
lacs from the Northwestern Military and
Naval Academy that went through the
1910 Glidden have been promised. They
will be equipped with wireless apparatus.
In addition there are half a dozen private
owners with Cadillacs, Mitchells, Nation-
als and Midlands who have promised to

go in this most strenuous run. It is figured that this not only will be a reliability run, but an opportunity for an adventurous outing for those motorists who have not yet had their vacations. There is a special prize up for owners.

LONG ISLAND CARDS RELIABILITY

New York, Sept. 23.—As a test of reliable service the Long Island Automobile Club will conduct a century run October 5. Under the conditions the contesting cars must make five control points without allowing more than 15 seconds tolerance at any of the checking stations. They are approximately 20 miles apart, and the whole course is exactly 100 miles. The aggregate running time for the 100 miles is 5 hours, or an average of 20 miles an hour. The course is from the old Pettit hotel, Jamaica, to the Mansion house, Roslyn, Grand Central hotel, Hempstead, Creed avenue and Hempstead turnpike, and back to the starting point at Jamaica. The prize is a tire of any make desired by the winner. The start will be at noon.

OHIOANS IN BIG SOCIABILITY

Cincinnati, O., Sept. 23—The first sociality tour of any proportions to be run out of Cincinnati took place Saturday under the auspices of the Commercial Tribune. The distance was 104 miles, and 175 cars and more than 800 people took part. The start was made from the Tribune office on Walnut street, near Fifth avenue, at 9 o'clock. Long before that time a large assemblage had congregated.

The route lay from Cincinnati to the Dayton Automobile Club and return. The participants were royally entertained upon reaching the Gem City. A big dinner was served at Hills and Dales, and there was general speechmaking.

The prizes were awarded to those drivers making the best average time. The average time for gasoline cars was 6 hours



AROUND LAKE MICHIGAN ROUTE

14 minutes. A notable feature of the run was the showing of the electrics. There were many women drivers and all handled their cars in surprising manner. One hundred and twenty-five of the entrants completed the full journey. Miss Helen Schmidt took the first prize in the electric class. The average time for the electrics was 8 hours 25 minutes. J. D. Bruner took down first prize in the gasoline class. For some reason the officials decided not to give out the names of the cars. The number of cars disqualified for running either too fast or too slow and failing to come within the prescribed limits of 5½ hours minimum running time for the round trip and 7 hours maximum time, was ten.

SYRACUSE HAS BIG RUN

Syracuse, N. Y., Sept. 21—One hundred ten cars, conveyed by a bevy of motor cycles, today took part in the fourth annual sociability run for the silver trophy cup offered by the Syracuse Herald. The small number of machines that turned out for the Watson cup run of the Automobile Club of Syracuse this summer had led some to believe that public interest in runs was waning. However, today's fine showing proves two things: First, that motorists hereabout prefer the shorter runs; and, second, that ideal weather and road conditions will bring them out. The list of prize winners, in their order, with times, follows:

MEN'S DIVISION

Driver and car	Time
C. B. Shaw, Buick.....	3:48:22
A. J. Conine, Buick.....	3:49:21
Darius Smith, Abbott-Detroit.....	3:49:40
S. L. Devendorf, Ford.....	3:47:15
A. C. Ferguson, Cadillac.....	3:47:12
J. J. Stark, Regal.....	3:47:11
A. F. Clasen, Moyer.....	3:47:00

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A. A. A. RELIABILITY RUN TROPHY

Harry M. Morrell, Maxwell.....	3:50:30
C. J. Travers, Regal.....	3:51:00
August Salenske, Buick.....	3:51:09

WOMEN'S DIVISION

Pearl Cheshire, Ford.....	3:47:38
Mrs. H. W. Link, Hudson.....	3:50:13
Mrs. J. S. Brown, Empire.....	3:47:15
Mrs. W. H. Carr, Regal.....	3:47:15
Pauline Single, Ford.....	3:54:04
Mrs. K. Woodard, Case.....	3:36:10
Miss Marguerite Walliser, Overland.....	3:32:30
Mrs. G. W. Stark, Regal.....	4:03:35

Mr. Shaw's Buick, the winner, has the distinction of coming in within 23 seconds of the official time designated, this being 3:48:45, and known only to Mayor Edward Schoeneck. For this run of 60 odd miles, over beautiful country southwest of Syracuse the secret time had been based generally upon both state and local speeding laws, and the times made showed that motorists had been studying these to a great extent.

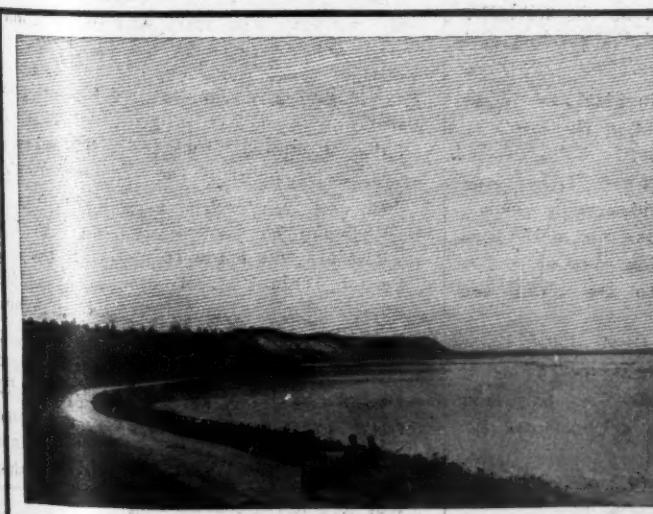
Never has a Syracuse run been attended by so favorable weather and road conditions. Most of the route, through a slightly hill and lake country, was over new state roads, and the liberal use of oil, combined with recent rains to render the usual dust problem negligible. It is an odd coincidence that two men named Shaw—not related—have been winners of the Herald annual run. Percival G. Shaw won in 1911. Miss Marguerite Walliser, in an Overland, is for the third time in the list of prize winners in this run. Seventy-Four in Lu Lu's Run

BIG EASTERN AFFAIR

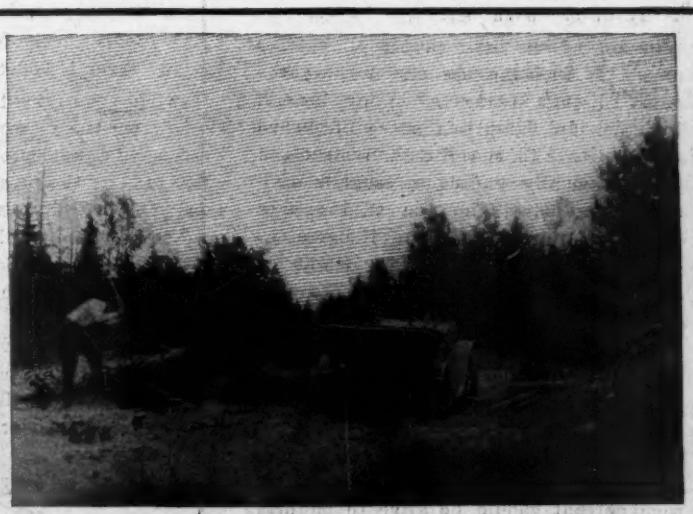
Atlantic City, N. J., Sept. 21—Car No. 2, a Cadillac, Charles L. Martin driver; No. 36, Pullman, C. Edward Firth; No. 25, Reo, David Cram, and No. 74, American, J. E. Mountain, captured the four prizes awarded the four contestants finishing nearest a secret time schedule in the second annual sociability run of the Lu Lu Temple Automobile Club from Philadelphia to the Hotel Strand, Atlantic City, today, seventy-four cars participating.

The official time designated for the 61 miles was 3 hours 13 minutes 30 seconds, and that the competition was keen is indicated by the fact that all four winners finished 2 minutes or less from the mark.

The weather was a trifle too cool for comfort, necessitating the wearing of heavy wraps, but the South Jersey constables made it warm enough for many contestants before they arrived at their destination. Alleged violations of the speed laws were numerous and in every instance those halted were not allowed to proceed until the stipulated fine was paid, the petty holdups interfering with participants' chances for prizes.



FINE ROAD AROUND BAY DE NOC, MICH.



CHICAGO PATHFINDERS CAUGHT IN SAND POCKET

Rubber Show an Educational Exhibit



VIEW IN RUBBER EXPOSITION IN GRAND CENTRAL PALACE

NEW YORK, Sept. 23—Crude rubber, rubber machinery used in production and preparation for market and in shaping the substance under various manufacturing processes, and the finished manufactured products, based upon rubber, are shown with a wealth of detail at the third international rubber exposition which opened at the Grand Central palace today.

The exposition will continue until October 3, and during that period the men connected with the industry, shippers, manufacturers and growers, will hold a convention similar to those of 1908 and 1911 in London.

Three floors of the big building are used for the show, the main floor being devoted to machinery, second to manufacturing processes, reclaiming, chemicals, etc., and the upper floor contains a very complete display of crude rubber.

There are twenty-two countries or states represented in the crude rubber show, the largest display being made by Brazil, which has an exhibition space of 10,000 square feet. All the Brazilian states in the Amazon valley are represented with complete displays of crude wild rubber and a small representation of the cultivated product. Among the other countries showing wild rubber are the African colonies of various European countries, Mexico, Central America, and some parts of the East Indies. The plantations are represented mostly in the displays of Ceylon, Malaya and the east.

Synthetic rubber has a part in the show, but from the commercial viewpoint it is not important at this stage of development. Such samples as are shown are said to equal the natural product in quality

and service, but are eliminated from consideration by the cost of manufacture.

On the third floor there are exhibits of crude rubber aggregating not far from 150 tons and worth approximately \$350,000 in the market. The Brazilian exhibits weigh about 90 tons and include all the commercial grades in six different varieties. All told, the different kinds of rubber shown in the Brazilian space number over thirty-five. The production of Brazil is about 40,000 tons a year.

Next in size to Brazil is the display of Malaya, which includes the Straits settlements and Malay states under British protectorate on the Malay peninsula along the straits of Malacca. This display is almost wholly of high grade plantation rubber, ranging from pale crepe, which is not smoked at all, to smoked block rubber, which is about as dark as the wild Brazilian product. The Malayan production is not far from 15,000 tons.

Ceylon comes next in size and importance from the viewpoint of the motor industry, its annual production being around 5,000 tons at the present rate. Other countries have exhibits, particularly the Philippine and Hawaiian islands, but, aside from Brazil, Malaya and Ceylon, they are not of the first importance to the motor car business.

It has been conservatively pointed out that the world's production of rubber in 1912 will be about 90,000 long tons, and that the motor industry will account for 31,000 long tons.

Production is increasing steadily, but not rapidly in Brazil, and is racing in the plantations of the mid-east. It is estimated that the total yield of the planta-

Grand Central Palace, New York, Filled with Exhibits Made by Big Industry

tions in 1915 will equal that of the indigenous product.

The United States Rubber Co. has one of the largest show spaces in the building. A full line of its product is displayed, and an interesting announcement has just been made by President Samuel P. Colt that the company has nearly finished the planting of 25,000 acres in the island of Sumatra. Reckoning this plantation at 200 trees to the acre and the eventual yield at 50 pounds of dry rubber per tree, the supply of rubber for this company will some time reach the enormous amount of 50,000,000 pounds a year. Such a result is still far in the future, as the oldest of the trees on the plantation is now only 18 months. Trees begin to bear after their fourth year, and the production is small until they are 12 years old or more. The life of the rubber tree has not been determined so far as the plantations are concerned. The oldest trees in the Ceylon plantations are about 36 years old, and all others are younger. The veterans are producing more rubber per tree than any of the others, and so far have shown few symptoms of age.

The exposition was preceded by a formal luncheon on Sunday, at which Henry C. Pearson, vice-president of the convention, acted as toastmaster. It was attended by most of the dignitaries present as representatives of the rubber countries, and the speeches promised much interest in the convention of the industry. Mayor William J. Gaynor opened the show this noon.

SALESMEN'S RALLY IMPORTANT

New York, Sept. 23—The sales managers' convention, which will be held under the auspices of the Automobile Board of Trade September 30 and October 1, probably will attract a large attendance, and preparations for a representative gathering are being made by the committee in charge.

The program of the meeting will embrace a wide field of observation. Among the subjects that will be treated by the convention are the following: Freight, shipping, motor car equipment, inclosed bodies, selling and advertising, and annual models. As a whole volume might be presented on any one of these subjects the chances are that the proceedings will be filled with interest.

The committee in charge of the affair includes the following: H. O. Smith, E. C. Howard, W. E. Metzger, C. W. Churchill, W. T. White.

Diagrams for New York Show Issued

Automobile Board of Trade Fires First Gun of Its Publicity Campaign

NEW YORK, Sept. 23—Application blanks and diagrams of the floor space for the two buildings in which the national show will be held January 11 to 25, have been issued, and the requests for space have been coming in at such a rate as to indicate that the show for next winter will be the greatest yet held in the city of New York.

As with the affairs of the past 2 years, the forthcoming exhibition will be one show, held in two buildings, the Grand Central palace and the Madison Square garden. The dates this year are from January 11 to 18, which will be known as the part 1 period, and in which pleasure cars will be shown, and from January 20 to 25, the part 2 period, when commercial vehicles will be exhibited. Accessories will be shown both weeks of the big exhibition.

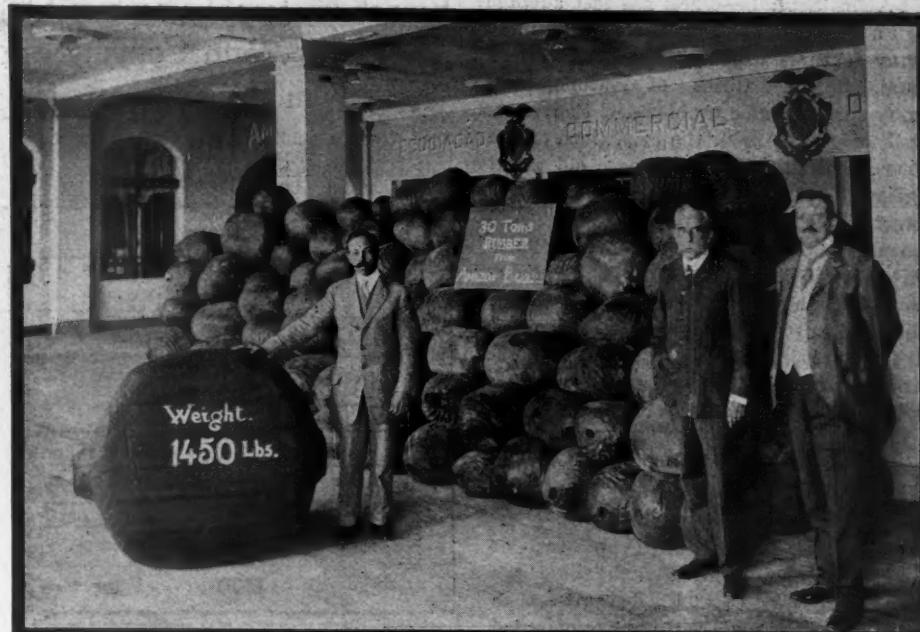
The preliminary preparations to be attended to have proven so gigantic, that the show committee has been working on the plans since early spring. A plan of decoration for both buildings has been worked out that is expected to improve the appearance of even the palace.

The number of applications that have been received for space in the Grand Central palace indicates that the building will be completely filled with exhibits, as will the garden. Merle L. Downs, secretary of the show committee of the Automobile Board of Trade, 7 East Forty-second street, New York, has increased his staff in order to meet the demand for information and applications.

There will be four floors of exhibits at the Madison Square garden; pleasure cars being shown the first week on the main floor, and on the elevated platform, and tires, parts and accessories on the elevated platform, in the basement, and on the balcony. Commercial vehicles will be shown only during the second week on the main floor and elevated platform.

Three floors will be devoted to the show at the palace, pleasure cars being shown on the main and mezzanine floors, during the first week of the show, motorcycles on the mezzanine and balcony floors, both weeks, and accessories, tires and parts, on the mezzanine and balcony floors, both weeks. Commercial vehicles will be shown at the palace on the main and mezzanine floors, during the second week.

The exhibits will be admitted for installation on Friday, January 10, and the show will be open to the public from 8 to 11 p. m. on the 11th, and from 10 a. m. to 11 p. m., on every succeeding day thereafter until Saturday, the 18th. These



THIRTY TONS OF RUBBER IN NEW YORK EXPOSITION

exhibits will be removed between the hours of 11 p. m. Saturday night, the 18th, until 1 a. m., the next morning.

At 7 a. m. Sunday morning the exhibits will be admitted for the second part of the show, and the second part of the show will open at 8 p. m. to 11 p. m. Monday evening, and from 10 a. m. on each day thereafter, until the end of the show.

Admission badges will be furnished each dealer, and signed invitation tickets may be purchased by the dealer for 50 cents each, on which payment is not due until presented at the door. General admission will be 50 cents for every day except Tuesday, the 14th, and Thursday, the 16th, when the charge will be \$1.

The usual rules in regard to gasoline or other fuels, smoking, insurance and liability obtain. Special rules are made prohibiting the use of lighted lamps, unless their light is cast upon the wall, or on an object within 3 feet of the lamps, so that it will not shine upon any person. No advertising souvenirs may be distributed, and no signs, such as price cards, sold notices, no pictures will be permitted in the exhibits, and only such literature may be distributed, as may pass the judgment of the show committee. No operable horn will be permitted, and no illumination other than that furnished or approved by the committee will be allowed.

Space on the main floor of the garden will cost \$2 per square foot, on the elevated platform, \$1.75, balcony, room 7 and concert hall, \$1.55, basement, \$1.50, tier boxes, \$60 to \$80 each. In the palace the main floor sells at \$1.50 per square

foot, while the mezzanine floor and balcony are listed at \$1.25 each.

DYER AND P. & S. AT PEACE

New York, Sept. 23—Licenses under two groups of Dyer patents have been granted to the Palmer & Singer Mfg. Co. and, the long litigation between the Enterprise Automobile Co. and the defendant concern will be abandoned.

The patents involved in the license rights are, first, the two covered by the settlement recently made between the Enterprise company and the Automobile board of Trade, by which the A. B. of T. was given the right to recommend the issuance of seventy-five licenses to its members, on payment of a lump sum to the assignees of the patents. These patents cover the selective type of gear-change mechanism with direct drive in use generally. The other patent is one of the group of five originally sold to the Patents Holding Co., in the days of the Association of Licensed Automobile Manufacturers, and which were re-conveyed to the Enterprise company as part consideration for the license rights granted to the A. B. of T.

It is understood that the royalty rate is to be one-tenth of 1 per cent on each of the three patents, thus making the aggregate royalty paid \$3 on each \$1,000, based on the retail list price. The Enterprise company has been inactive in prosecuting individuals since the settlement was made.

The suits against the defendants are docketed in the United States district courts for the southern and eastern districts of New York, and will be expunged from the records shortly.

Paris Issues New Traffic Regulations

PARIS, Sept. 15.—Paris has just adopted a new set of traffic rules containing many features worth noting by American municipalities. Cities of Europe have many special traffic problems of their own. Built originally to fit the conditions of the times, the old sections of these old world cities are generally a mix-up of narrow streets, with narrow sidewalks and crowded traffic. In many places traffic is only allowed in these streets in one direction, returning traffic using another street. Vehicles must keep moving at a trot at all times in some of these narrow thoroughfares to handle the number of vehicles seeking to pass through with any success.

The mixture of vehicles is worse than in America. There are single-horse rigs with two and four wheels, two-horse outfits the same, and many three-horse wagons. Passenger buses are frequently of two or three-horse equipment, though these are fast giving way to motor buses even in Paris. London and Berlin have adopted the motor almost exclusively.

Push carts are common, and motor trucks gaining in number, while pedestrians swarm everywhere. Paris is especially careful in the handling of foot traffic. Vehicles in Paris cannot back to the curb, but always must face parallel with the street.

Warning horns or signals are not allowed to be used except for their purpose. It is forbidden to use them for a waiting signal.

Vehicles are not allowed on the road that are so built as to hinder a clear view of the driver to the side and to the rear. Drivers are not allowed to crack their whips.

Pedestrians are required to take the right hand sidewalks on narrow streets. The complete traffic code as translated follows:

OBEDIENCE

1—Street car conductors, motormen, engineers, coachmen, chauffeurs, cyclists, etc., will pay obedience under any and all circumstances to the signals given by policemen, whether by word or by hand. In everything that relates to the approach or start from any place whatsoever, the taking on or letting off of passengers, loading or unloading of goods, etc.

2—Ignorance of these rules will not be accepted as an excuse for non-compliance. Every street car conductor, motorman, engineer, coachman, chauffeur, cyclist, etc., is required to follow these instructions, to avoid blockades, facilitate traffic, prevent loss of time and money, etc.

The police are ordered to enforce the observance of these rules.

SECTION 1. WHEN PASSING, TURNING, CROSSING AND STOPPING, KEEP TO THE RIGHT

1—Every vehicle, excepting when overtaking another, must approach the sidewalk on the right. But in streets with narrow sidewalks, the vehicle must not come quite close to the sidewalk, so as not to trouble the users of the sidewalk. When necessary, drive only as fast as a walk.

2—Every vehicle that meets another which comes from the opposite side must pass it on the right.

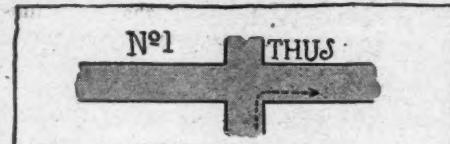
3—Every vehicle must pass to the left of those that go in the same direction and is not allowed to come back to the right until it has overtaken them completely.

French Metropolis Frames Up Ideas Worth Copying in America

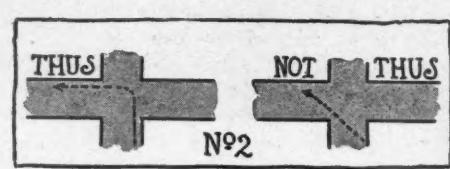
4—When a public road is divided lengthwise by viaducts, depressions, islands, platforms, etc., the vehicle will pass on the right; still, exceptions may be authorized.

5—Every vehicle that turns must keep to its right.

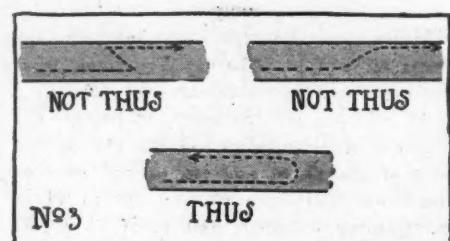
To turn to the right: See sketch marked 1.



To turn to the left: See sketch marked 2.



6—Every vehicle that passes from one side of the road to the other will go thus: See sketch marked 3.



7—Squares and crossings having an island for pedestrians in the center. In general on all squares in whose center is an island, place of refuge, public monument, etc., carriages must cross by keeping to the right and thus passing around the island or monument.

8—Traffic of carriages in the Avenue des Champs-Elysées. The central part of the Champs-Elysées boulevard, that is included between islands, is exclusively reserved for motor cars and motor vehicles; horse-pulled carriages, cycles, tandems, etc., must keep to the right on that part of the boulevard which is between the islands and the sidewalks.

9—When a vehicle stops, it must do it in such a way as to have the sidewalk at its right, except on the roads where the traffic is ordered to go along in one exclusive direction.

10—No vehicle is allowed to lean back against the sidewalk. It always must stand parallel with the street.

11—No vehicle, unless it be in a case unlooked for, or at least unless it be to let another vehicle or pedestrians overtake it, will stop on the public road, otherwise than near the sidewalk on the right and in such a way as not to trouble the pedestrians. Buses and motor buses must keep with the sidewalk as closely as possible to their right when stopping.

12—In all streets where there is not a space of at least 9 meters or 30 feet between the sidewalks, drivers of vehicles are not permitted to stop opposite a vehicle which is already standing on the other side.

13—Vehicles that are forced to make a half turn must take all precautions necessary so as not to hinder the traffic.

SECTION II—SIGNALS.

1—When slowing down or stopping, the driver of a vehicle must make a signal to those behind him by vertically raising the whip or hand.

2—On turning around or starting to move, he must indicate with the whip or hand the direction that he is about to take.

3—Before backing up, he must make a like sign, and while backing up, he must see to it that he does not push or hurt those behind him.

4—No vehicle is allowed to pass on that is not provided with the lights, etc., prescribed by ordinance.

5—The warning horns must serve for no other purpose, nor must they be used more than necessary, especially at night.

6—Cycles, tandems, tri-cycles, etc., must be equipped with an alarm device attached to the machine. The device must emit a sound that is heard at a distance of 50 meters or 165 feet, and must be capable of being put in operation whenever necessary, and only in such contingency.

SECTION III—RIGHT OF WAY.

1—Patrol wagons, ambulances, mail coaches and fire engines have the right of way over all other vehicles.

2—Street cars have the right of way over all other vehicles, except at crossings. Coachmen, etc., who have taken up the rails ahead of a street car must go off the track at the first signal of the conductor, motorman or engineer.

3—In streets where direction signs are displayed, all vehicles are to follow rigorously the direction indicated.

4—No vehicle must stop without good reason.

5—When a fire engine or any other emergency vehicle approaches, other vehicles must go as near the right, towards the sidewalk, as is possible.

SECTION IV. SPEED

1—No vehicle will exceed the speed limit set in the ordinance and that may be justified by the circumstances.

2—On crossing the streets, vehicles will slow down.

SECTION V. STREET CAR STOPS

Conductors will slow down, and stop their cars if necessary, on approaching the fixed and optional stopping places of street cars, when cars or trains are there already stopping to take on or let off passengers.

SECTION VI. CONTROL, SAFEGUARDS WITH HORSES

1—No carriage must stand on the public road without being guarded, or without its wheels being firmly locked by a rope or chain.

2—When riding on or leading a horse, the person in charge will never give the reins out of his hands.

SECTION VII. VEHICLES

1—Under no pretext will a vehicle be tolerated that is built or covered in such way as to prevent the coachman, etc., to distinguish clearly the carriages that follow it or are at its side.

2—No vehicle will be built or loaded in such a way as to hinder the general traffic.

3—Under no pretext must a vehicle be made use of or driven that is loaded with iron or other material which is likely to cause an unnecessary noise in striking together, unless the noise has been weakened or muffled by special device.

4—No vehicle may be driven by a person under 18 years of age and who is not competent for the purpose.

5—It is forbidden to cling or fasten oneself to the rear of any carriage.

SECTION VIII. CONDITION AND TREATMENT OF HORSES

1—Owners must not put in service horses who are not fit to do the work for which they are intended. It is also forbidden to make use of horses that are vicious or suffering from contagious diseases, ulcers or repugnant deformities.

2—No driver is allowed to crack his whip.

SECTION IX. RIGHTS AND DUTIES IN REGARD TO PEDESTRIANS, DRIVERS, ETC.

The carriage road is intended in the first place for vehicles, but it should be well understood that pedestrians have the right to cross it in safety. Street car conductors, drivers, etc., are therefore to use all necessary precautions, in order not to hurt or annoy those on foot; and these latter ones have the duty, before leaving the sidewalks and islands, to look ahead of them and see what vehicles or street cars are approaching.

Pedestrians are therefore, in their own interest, requested to mind the following precautions:

On passing the street, it should be done as much as possible at a right angle, and preferably at a regular passage.

The traffic will thus be assisted and the work of the horses be made less irksome, for often it is necessary to stop them in a brusque manner and pull back their mouths cruelly, so as not to hurt passers-by who are more or less negligent.

Such negligence of pedestrians will, however, in no case be an excuse for drivers, etc., who are not to annoy or hurt them.

The pedestrians who use the sidewalk will keep to the right. And in streets where the sidewalks are narrow, they will take the sidewalk on the right side. They will avoid stopping just at the crossing of a street, and do this rather on the sides of the sidewalk. They will also avoid standing aimlessly at theater exits or public meeting places.

Traffic Control Ideas by Coast Chief

LOS ANGELES, Cal., Sept. 16—"The question of regulating traffic is being considered in many states and cities and also in states and municipalities that possess traffic laws which require revision up or down, as the problem may demand," says C. E. Sebastian, chief of police.

"In discussing this question I shall go somewhat into detail as to what appears to be the most important phases of the situation and offer some suggestions concerning what I believe to be the better method of handling this branch of our work. The first important point is that of uniform laws for registration of motor vehicles. Hitherto, each state has passed laws in its own way—if the lawmakers have given the subject any consideration at all—but many of them have done so without properly weighing the consequences or effect of such laws as applied to the pedestrian or persons of foreign jurisdiction traveling within their states.

Variations in State Laws

"Some states prohibit the operation of a foreign motor car unless it displays a local number. Others permit it for periods ranging from ten days to an indefinite period. I suggest that all state laws regulating the registration of motor vehicles require annual registration, say dating from the first day of each year; that a uniform license fee based on a sliding scale, according to the power of the machine, be added, and that all cars display number tags front and rear. These conditions complied with, I believe it a good policy to allow the owner of the car to have the free use of the roads and streets of any state without additional cost, provided, however, that the said owner on entering a sister state, registers with the city clerk or recorder or other judicial officer, his name, car number, permanent and local address and the period of time he expects to remain in the city he is visiting. If he does not contemplate remaining there more than 24 hours, I would not exact these conditions.

"I favor, too, a law requiring all motor cars to be registered in the state in which they are when the period of registration expires. This will enable the authorities to keep track of them and prevent tramp machines being used by criminals or unscrupulous persons.

"Still another forward step would be in enacting a law which would compel each secretary of state to publish monthly a list of registered cars with owner's name and address, also that of chauffeurs, these lists or reports to be sent to the state secretaries free of charge. This law, too, might provide that each secretary of state be required to forward these reports to the chiefs of police of cities possessing more than 25,000 population. I prefer this method to that of a national registration, it

Los Angeles Policeman Airs His Views on Handling Vehicles in Cities

being less cumbersome, and placing the motor cars and their owners in closer touch with the authorities.

"As to the general provisions of the state laws, I believe they should be uniform concerning regulations of movements of vehicles along highways and city streets. After a careful study of the laws of several states, I believe the maximum speed in congested districts where traffic is heavy, as within the shopping district, should be 12 miles per hour and have this district determined and described by the city law-making body. Outside of this district and inside the city limits, a maximum speed of 20 miles per hour would not be objectionable. Outside incorporated cities and towns, a maximum of 25 miles per hour would not operate as a hardship on any rational motorist. Speed on crossings within the congested district should not be more than 8 miles per hour and outside the congested district not more than 15 miles at any railroad crossing or where the view of the driver is obscured from cross streets or roads. Where local authorities designate a restricted district, they should be required to place signs in all principal streets leading into said district for the purpose of notifying the drivers to slow down to the legal speed limit of 12 miles.

Minor Regulations

"Of minor regulations, there are many things to be studied, each municipality or locality possessing different notions and rules for enforcement. These regulations insofar as possible should be uniform to the end that sensible and fair-dealing touring motorists will not suffer inconvenience and embarrassment when rounded up by well-meaning peace guardians.

"Drivers should be required to turn to the right on meeting vehicles moving in the opposite direction and to pass to the left when overtaking and passing vehicles going in their direction. In turning corners, the driver, when he desires to turn to the right, should keep to the right hand curb or gutter. In directing the vehicle to the left, the driver should go beyond the center of the street before turning. All drivers should be compelled to exercise due caution in approaching and passing vehicles and pedestrians. Of course, whistle, hand or other signals should be employed where a traffic police squad is maintained.

Favors Street Car Law

"Where there are street railways the driver should be compelled to keep his vehicle at least 4 feet from the street car

when the latter is not in motion. In passing such car, the driver ought not operate his car at a rate of speed greater than 8 miles per hour. Intoxicated persons should be prohibited from operating cars and other motor-propelled vehicles at any and all times.

"Make it a felony for intoxicated drivers to injure any pedestrian or occupant of another vehicle and the criticism of this class of drivers will end with the decrease in this type of law-breakers.

"Every traffic law should require the use of mufflers on machines in operation in cities and towns and should prohibit the use of the entot while the machines are inside the city limits. The smoke emitted by motor cars is a nuisance and easily could be regulated.

Examining Drivers

"Now to the question of compelling the drivers of motor vehicles to pass an examination. We do not require it in California, but I am urging such a law, as I believe it a safeguard in many directions. As evidence of the needs of such safeguards, not only to the public in general, but to the driver and his family, we only have to glance at the Monday morning papers and scan the list of Sunday accidents which reveal in some cases that entire families have been wiped out of existence as the result of collisions between electric or steam cars.

"These accidents as a rule are due to the lack of proficiency on the part of the driver, who, perhaps, is the head of a family and is busily engaged throughout the week, and for Sunday plans a trip into the country with his wife and family. Because of the fact that his nose is at the grindstone on week days, he has not familiarized himself with the country roads. Neither is he well acquainted with his car. Presently, as he guides the motor car along a pleasant lane or a splendid country highway, he encounters a railroad crossing. The warning toot or a steam or electric whistle alarms him—an express train may be approaching at lightning speed, or it may be an equally swift electric car. He finds himself in a dangerous position. His confusion and ignorance of what to do in emergencies like this one prevents him from properly using his brain and hands and the consequence is that he does the wrong thing at the wrong time—the coroner and the undertaker then figure in the case and the public says, 'What a pity; we ought to compel motor car drivers to undergo an examination, one that would require proficiency and a knowledge of what to do in such emergencies.'

"Every driver should be required to take an examination before a competent board of examiners appointed by the state executive and paid by the state. Examinations could be held fortnightly or at

longer periods—let that rest with the officials. After the driver has demonstrated his ability to operate and control a motor vehicle, a certificate should issue to him, enabling him to obtain a license upon the payment of a fee. Those desiring to qualify as professional chauffeurs would be under another class and should be required to furnish evidence of good character and sobriety.

"Each driver, whether chauffeur, owner or rider of a motor cycle, could be provided with a regulation book in which his license would be placed, with his photograph, and stamped with the state seal. It might be well to provide the book with blank pages, so that these could be used in stating the holder's record of violations and convictions—this to be inscribed therein by the magistrate. The driver ought to be compelled to carry this book with him always, and to display it upon call when a peace officer makes the request. A copy of such records as are entered in this book should be forwarded to the secretary of state, this to provide him with a complete history in the event the driver loses possession of his book and license.

"When the owner or driver of a motor vehicle has been found guilty of a violation of the law or ordinance, I believe the magistrate, if the offense is sufficiently serious or flagrant, should have the authority to recommend that the license of either driver or owner be suspended or revoked, as the gravity of the offense may justify.

"This is another issue I am working to push through in Los Angeles. This should be a state law, but in the event it is not, I hope to induce the councilmen to enact an ordinance that will assist us in handling the cases of drunken drivers. As this question now stands, Lieutenant John L. Butler, commanding our traffic division, handles the situation in so far as it concerns the drivers of public motor cars. The drivers are required to obtain a street stand permit. When one of them operates a car while intoxicated, the lieutenant recommends the revocation of his street stand permit, and that teaches him a lesson, as his recommendation stands without question, because it is not exercised only in emergency cases."

ADDITION TO R. A. C. HOME

London, Sept. 14—The Royal Automobile Club's headquarters in Pall Mall, on the side of the old war office, have been open only about 18 months, but already they have been found too small. The club is preparing to build another wing to the premises, in which extra bedrooms will be provided for members, as well as rooms for the officers of the club. The present building occupies two-thirds of the former war office site, and the extension will cover the remaining third. The club has spent something like \$1,500,000 on the premises and the extension will bring the cost of the whole undertaking up to well over \$2,500,000.

Central Illinois Outlook

Rush Over Down-State After a Most Successful Season—Bumper Crops Make Good Business for Dealers—Demand of Farmers is for Low and Medium-Priced Cars

LOOMINGTON, Ill., Sept. 21—The rush is over in the motor car business of central Illinois and dealers are commencing to summarize the year's business and plan for the year to come. The demand for cars in this territory has exceeded all expectations, and one firm, at least, has tripled its business during the fiscal year just closed. This firm, which has specialized on Overland cars, has sold 127 of this make and four of other makes, making the total for the year 131.

The central Illinois territory has been unusually favored by reason of bumper crops this season. Not only was the oat crop a record-breaker, but corn promises to give the greatest yield in a decade, providing there is no early frost. The crop is late and a frost before the first of October might create heavy loss in some sections. This danger is considered remote, however, and it is safe to say that the farmers of this section of the state will be blessed with well filled purses and a motor longing.

Dealers in this section of the state are preparing to cater to the rural buyer. It is believed that the rush in the cities is past. Most of the urban residents who can afford cars have been supplied, and, while there will be the usual shift from the old to the new car, the great mass of purchasers from now on will come from the country.

The farmers have the fever and the attack is not a mild one. They are starting out cautiously and conservatively and the great majority are averse to wrapping up several thousand dollars in a car before they know how to handle it. They prefer to buy a car from \$800 to \$1,200 and practice upon it. In the succeeding years, if they have the money, they will buy a higher priced article.

The agents in the smaller towns contiguous to Bloomington, and who sell almost exclusively to the farmers, agree that this view of the situation is correct. Sales of cars above \$1,500 have been few and far between during the past year in the territory outside of Bloomington. Ninety per cent average \$1,000. The local dealers also report that it is becoming difficult to interest city buyers in the high priced cars. Even the men who can well afford to buy a car ranging from \$3,000 to \$5,000 are, in the majority of instances, going below \$2,000, and the makes above the latter figure are meeting with slow sale.

It also is being demonstrated that the curbstone agent has small chance in competition with the dealer who operates

garage and suite of offices in which to receive buyers. The former are rapidly being driven out of the business in this territory and the larger institutions are monopolizing it. The retail business is appearing to be centralized and restricted very much like the wholesale and the manufacturing. This is severe upon the ambitious youth with plenty of enthusiasm and a good car who is without capital to install his business in a respectable appearing building.

Not only has the year been a prosperous one for the dealers in gasoline cars, but this territory has furnished profitable picking for those who handle the electrics. In fact, the electrics comprise about all of the high-priced cars disposed of in this territory this year. There were twice as many gasoline cars sold in 1911 costing above \$2,000 than during 1912. The sale of electrics ranging around \$3,000 has doubled over the preceding year.

Reports of a scarcity of cars for the year to come are coming in and are regarded by the local dealers as an indication of prosperity. A shortage of anything always begets a demand and the difficulty in procuring cars during the next 6 months means that the demand will strengthen. It is predicted that the business in central Illinois during 1913 will far exceed the banner year now waning.

HOOSIERS PREPARE FOR CONVENTION

Indianapolis, Ind., Sept. 23—A motor parade with no fewer than 2,000 cars in line, a balloon ascension with the passengers riding in a motor car substituted for a basket, demonstrations in skillful driving, a dinner and addresses by advertising men of national reputation will be among the features of the national salesmanship and advertising convention, to be held in Indianapolis, Tuesday and Wednesday, October 8 and 9. W. D. Nesbit of Chicago will preside over the convention as permanent chairman, according to present plans. An address of welcome will be delivered by Charles A. Bookwalter. Among the prominent advertising men who will make addresses on salesmanship will be Elbert Hubbard of East Aurora, President Sheldon of the Sheldon School of Salesmanship, John Lee Mahin of the Mahin Advertising Co., Leroy Pelliteer, Detroit, director of advertising for the Flanders; Martin Kelley of the Fuller advertising agency, General Manager Deeds of the National Cash Register Co. and General Manager Laskar of Lord & Thomas. Those who are promoting the convention believe that 1,000 motor car salesmen will attend.

Bumper Crops in Dakota

Reports from Farmers Encourage Dealers in Motor Cars
Who Prepare for Heavy Fall Business—Salesmen Travel
Through Rural Districts Running Down Prospects

ARGO, N. D., Sept. 23—Bumper crop conditions in North Dakota this fall are attracting the attention of car manufacturers and dealers everywhere, with the result that a number of new agencies already have been established or announced for Fargo and other state cities. Old agencies already in the territory are increasing their sales forces to handle the increased amount of business which the dealers believe is assured.

Crops in the state are now beyond the prospect stage and it is certain the farmers will harvest the biggest yields of the past 15 years. While harvest and threshing have been delayed by the heavy and frequent rains during August, the work now is far enough along to foretell further weather damage and to give reliable indications of what the yield will be.

Wheat, the leading crop of the state, will give a yield several bushels above the average for the last 15 years and almost double the yields reported for the 2 previous years, both of which were attended with crop failures. Reports that the heavy rains had started the grain sprouting in the shock are denied by farming experts who have traveled through the state. In certain sections of the state grades have been lowered but the damage is not sufficient to affect the state as a whole.

Flax, barley, rye and oats are all yielding crops far above the average. Corn is ripening rapidly now and experts believe that for the first time in the history of the state the farmers will raise their own seed corn for 1913 planting. Potatoes have been attacked by a form of stem rot. In spite of what damage this may do the yield is likely to be so large that the price will go very low.

Motor car salesmen already are busy among the farmers of the state and the number of orders received at the branch houses is increasing rapidly. All grades of cars are being sold, the orders including high-priced touring cars as well as the lighter cars and those constructed with especial provision for the farmer's needs.

QUAKER WHEEL TAX PROPOSED

Philadelphia, Pa., Sept. 20—Mayor Blankenburg, in his fall message to the councils yesterday, offered a suggestion that directly concerns every car owner in Philadelphia and that has called forth protests from motor car organizations and agents. His proposition is to the effect that a municipal wheel tax be levied on

all motor cars according to horsepower, as a means of increasing the annual revenues of the city and reducing the deficit. The mayor thus sets forth his proposition:

"It seems to me that if not in conflict with state laws the city should charge a tax on motor cars—the state tax is \$10—pleasure as well as business. This tax—of 25 to 50 cents a horsepower per car per annum—should be made applicable to the maintenance of highways. No one will gainsay the fact that motor cars are largely the cause of the heavy cost of street repairs and maintenance—particularly on the macadam and country roads, of which we have more than 400 miles—and add materially to the labors of the department of public safety."

ASHLAND COUNTY'S ROAD WORK

Ashland, Wis., Sept. 23—Ashland county, Wis., has, during the season of 1912, constructed more permanent highways than any county in Wisconsin, which is regarded as particularly remarkable in face of the fact that Ashland is one of the northernmost counties in the Badger state, bordering on the south shore of Lake Superior, and that most of its area is still a wilderness.

The fine showing of Ashland county is due to the excellent organization of its highway division under the new state aid law of Wisconsin. George Foster, a millionaire lumberman of Mellen, Ashland county, and naturally deeply interested in the development of the territory for settlement, accepted the appointment as highway commissioner. Throwing his entire resources behind the good roads movement in Ashland county, Mr. Foster took the good roads fund of \$77,000 provided by bond issue of the county, the state aid apportionment and moneys raised by the townships, and added to it a complete railroad system, a half-dozen steam and gasoline rollers and a crew of experienced road builders from his own lumber camps and mills. The railroad system, consisting of 10 miles of standard gauge track, an equal mileage of portable trackage, a second-hand locomotive and a string of forty dump cars, has decreased the otherwise large and important item of transportation and haulage of road construction materials to nothing.

The principal work this year consisted of constructing a permanent highway, 45 miles long, from Ashland to Butternut, via Mellen, stretching entirely across Ashland county from its northern end to southern boundary. The road runs along the right of way of the Soo line, the

tracks being $\frac{1}{2}$ mile from the road at the greatest point, and generally within 100 to 300 feet of the tracks. This enabled Mr. Foster to build spur tracks to various points and haul his materials and tools to and from the Soo line, which contracted for the haulage from the source of supply.

The state highway commission early in the year arranged with all railroad systems for reduced rates for hauling materials, which, too, enabled the Ashland road builders to haul rock from the iron mines at Bessemer, Mich., to Ashland, a distance of 50 miles, at \$1.50 per car. The cars were turned over to Mr. Foster's railroad at various points.

BUFFALO HOLDS GYMKHANA

Buffalo, N. Y., Sept. 23—About 1,500 motorists in 400 cars witnessed the fourth annual gymkhana of the Automobile Club of Buffalo at its country club grounds at Clarence, N. Y. Results of the various events were as follows:

Tortoise race, winning car being designated as one last to arrive at finishing line. Won by W. C. Frank, Pullman. Time, 5:22.

Thread-needle race, each contestant being compelled to drive 50 yards, alight and run afoot 50 yards to a woman stationed at the end of the field, thread a needle and return to his car accompanied by the woman furnishing the needle and then drive to finishing line—Won by W. C. Gibson, National, assisted by Miss C. Stedman. Time, :40%.

Potato race, with car moving over prescribed course. Driver was accompanied by woman who dropped potatoes in flower pots, winner to be woman who could drop a potato in each pot—Won by Edwin J. Boeck, in Overland, accompanied by Miss Elinor Boeck, who dropped one potato in each flower pot.

Cigar-lighting competition, each contestant driving to first station of course and alighting, removing his coat while so doing and then lighting a cigar; driving to next station, alighting and drinking a glass of water and then driving for finishing line with coat buttoned and cigar lighted—Won by Charles O. Almendinger, Hupmobile. Time, 1:16%.

Nightingale competition, each competitor driving 50 yards, stopping his car and then running 50 yards afoot to a woman stationed at end of course; whistle an air, the name of which was to be written on paper by the woman posing as the auditor; return with the woman to the car, start the engine and then spurt for the tape. E. A. Kinsey, Velle, accompanied by Mrs. W. F. Polson.

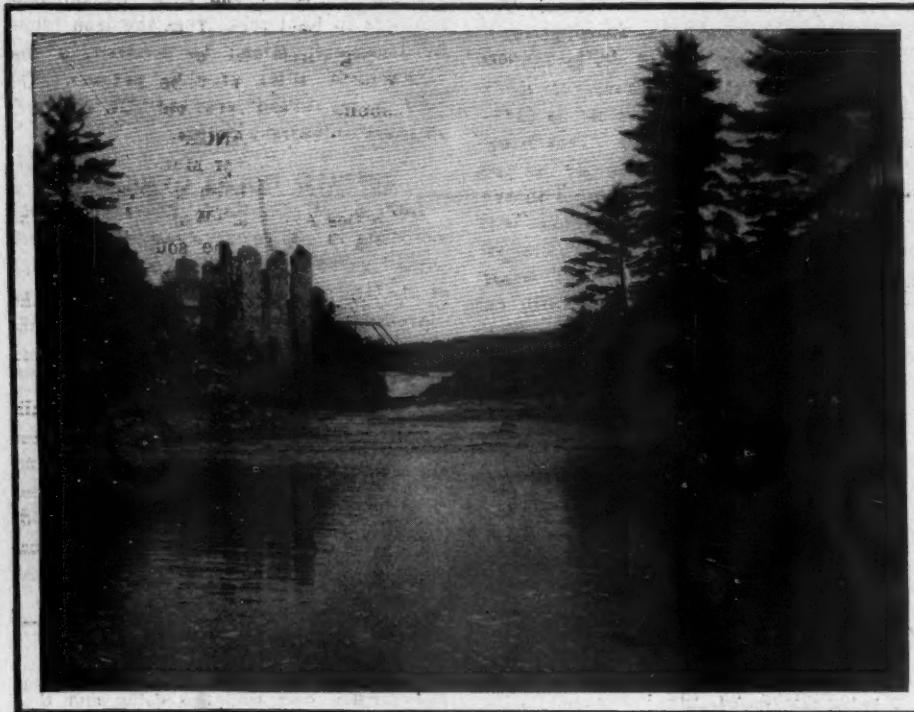
Bomb race, driver making fastest time over course filled with vari-colored balloons fastened to small stakes, the winner to be the car bursting the most balloons—Won by Augustus F. Scheu, Jr., Hupmobile, with six punctured balloons to his credit.

This was won by Augustus F. Scheu, Jr., in 2 minutes.

IOWANS OUTLINE RELIABILITY

Des Moines, Ia., Sept. 23—V. W. Reynolds and Logkeeper A. R. Hultman are this week blazing the way for the annual endurance run of the Iowa Automobile Association, which will start on October 7. A Chalmers six is being driven by the pathfinders. As now outlined, the run will leave Des Moines over the River-to-River road as far as Adel, where it will take the White Pole road to Council Bluffs, which will be the first night's stop. The second day out will follow the Missouri river to Sioux City for the night control. Fort Dodge probably will be the third night control, the Hawkeye highway being followed part of the way from Sioux City. The fourth night will be spent at Cedar Rapids and the trip home on the fifth day will be by way of Oskaloosa.

Routes and Touring Information



FALLS AND OLD MILLS AT STODDARDVILLE, PA.

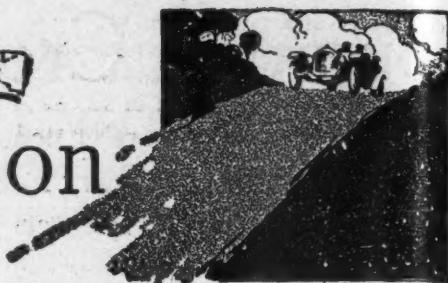
CHICAGO.—Editor Motor Age—Early in October I intend to make a motor car trip of 1,000 to 1,500 miles originating in Chicago. Kindly inform me where I will find the finest scenery and the best roads. I know already the east.—Foreigner.

For an Indian summer trip it would seem quite in keeping to visit the land of Minnehaha. The country that lies between the Windy City and the Twin cities is varied in aspect and richly picturesque. At the season selected for your tour the luscious greenery of the summertime that gave the heated landscape a cooling tone, as the air has become tempered assumes warmer tints, and these autumnal glories of the northern woods are too seldom seen by Nature's summer lovers. Few know, and therefore appreciate the wealth of joy to be found on the hills and in the forest ways after "the first sharp frosts have fallen." It is Nature's vacation time, and with her free hung banners invites all to join in such a love feast as she spreads at no other season of the year. It is the ideal time for touring.

To reach this storied land of Indian fable drive west on Jackson boulevard through Garfield park, Oak Park and Addison to Elgin, made famous by the

Circle Tour from Chicago

watches manufactured there, and its great dairy interests. Following along the east side of the Fox river one reaches Algonquin, known to the world through the



yearly motor classic hill climbing event, then on the west side of the river following its charming valley filled with beauty, on through McHenry, Richmond and Genoa Junction to Lake Geneva. A splendid driveway encircles the lake, faced by the summer palaces of many of Chicago's wealth laden citizens. Proceeding in the afternoon through Delavan, Emerald Grove, Janesville, Edgerton and Stoughton, winding among Wisconsin's numerous lakes, to Madison, makes the mileage of the day about 160 miles over good roads. If the trip around Lake Geneva is made, perhaps not much time will be left for seeing Madison that day.

The forenoon of the second day can very well be spent enjoying some of the most delightful drives in and around the Badger state capital, and site of the state university. Turning northward from this seat of learning and center of worldwide civic problem solving, the way lies through Pinebluff, Barneveld, Dodgeville, Edmund Station, Cobb, Montford, Fennimore, Mount Hope and Bridgeport reaching the broad Mississippi at Prairie du Chien. Fair to good natural dirt roads will have been found through the rolling, hilly, beautiful country in this part of Wisconsin, which affords many delightful views that are well worth overcoming the few intervening poor stretches of road. This is a portion of a cross-state route the entire length of which must eventually be put in a condition commensurate



FLANDERS ON NULREIGH HILL BETWEEN NEW HAVEN AND BUFFALO, KY.

with the country through which it passes. Prairie du Chien might afford the second night's control, as the speedometer will register in the neighborhood of 105 miles for the short day's run after a late start from Madison.

The upgrade out of the Mississippi valley to be negotiated on the third morning is long and winding affording great beauty of scene. Running north through Mt. Sterling, Viroqua and Westby to Portland, a sharp turn to the west is made and the route continues via Middle Ridge and St. Joseph to La Crosse with its knitting mills. The morning's run of about 88 miles makes this a good noon stopping place. After glimpsing the Mississippi river here the route turns away from it again taking the motorist through Holman, Galesville, Whitehall and Brackett to Eau Claire. The nature of the country will now be found mostly level, some rolling, and the roads very good natural ones, while some of the wayside points will be Menomonie, Knapp, Wilson, Baldwin, Hudson and Lakeland, reaching St. Paul after a drive of approximately 87 miles, arriving by noon. The afternoon will be replete with the delights of the Twin Cities' wonderful boulevards and parks, included in which is the famous cataract, Minnehaha falls. Summit avenue, the principal residence street of St. Paul is one of the finest in the United States. A trip should be made across "high bridge" as it affords a commanding view of the city and vicinity. Minneapolis, 10 miles distant, is reached by the magnificent boulevard system. The state university is located here.

Another and very attractive route from the industrious city of knitting to the Minnesota capital is one which crosses the river at once to La Crescent and traces the west bank of the river, thereby affording excellent views of this mighty stream and its bordering hills. The longer road from La Crescent to Ridgway is the more scenic, but, of course, means more hills, from which the vistas are more alluring. Thence to Witoka and Winona, the last named place is one of the most important grain shipping points of the Northwest. Proceeding from here to Rochester may be seen St. Mary's hospital where has been accomplished such wonderful achievements in surgery by the world-famed Mayo brothers. Leaving Rochester and driving through Zumbro Falls, Lake City, Frontenac, Red Wing, Miesville, Hampton, Empire City, Rich Valley and Wescott will take one into St. Paul on fair to good roads over rolling country.

A visit to Lake Minnetonka, 15 miles to the west, will be made as the return trip is begun, passing thence to Excelsior, Chaska, Jordan, Belle Plains, LeSeur, Ottawa, St. Peter, Nasota and Mankato. Touring east from this point will be reached Eagle Lake, Madison Lake, Greenland, Elysian P. O., Reeds Lake and

Waseca on the way to Onatonna. Bearing now to the south the route runs through Geneva, Albert Lea, Glenville, Northwood, Kensett and Manly, making this day's run into Mason City about 195 miles.

On the fifth day continuing southward through Iowa's great dairy country, over dirt roads good in dry weather, Hampton and Ackley will be passed through on the way to Marshalltown. Here the route intersects the official Iowa transcontinental route which will be followed eastward through Montour, an Indian reservation, Tama and Belle Plaine to Cedar Rapids, which may be selected as this night's control, the distance traveled being about 167 miles.

The transcontinental route may be followed clear to the state boundary at Clinton touching by the way Mt. Vernon, Mechanicsville, Clarence, Lowden, Wheatland, Grand Mound, DeWitt and Elvira. At Clinton, Eagle Point park will be found of interest. Crossing into Illinois, a most direct route connects with Chicago via Morrison, Sterling, Dixon, Franklin Grove, Ashton, Rochelle, Creston, DeKalb, Geneva, Lombard and Maywood.

But as the mileage limit mentioned has by no means been overrun, it would be interesting to leave the transcontinental route at Clarence, bearing to the south-

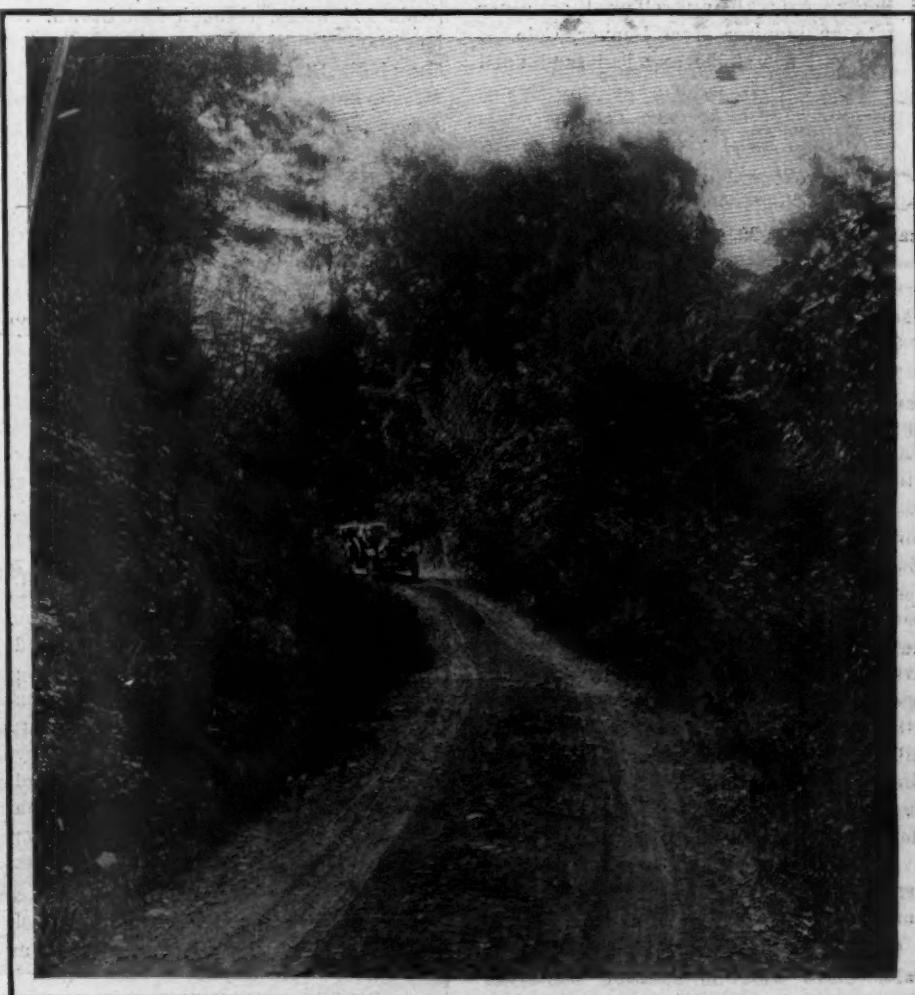
east through Bennett, to Davenport, where in the Tri Cities—Davenport, Moline and Rock Island—is found one of the most important manufacturing centers in the middle west. Rock Island park on an island by that name should be visited, where Col. Davenport's original home may still be seen. From Moline the road follows up the exceptionally delightful valley of the Rock river passing through Hillsdale and Lydon to Sterling, when the remainder of the route as outlined above may be followed to Chicago.

Running directions for the greater portion of this route may be found in the Automobile Blue Books, volumes 4 and 5.

ALBANY TO LOS ANGELES

Albany, Mo.—Editor Motor Age—Please give me information on a route from Albany to Los Angeles. Which would be the best, the north or the south route? If we go the south route how about the sand and desert? What is the distance of the south route? As to the north route through Salt Lake, would it be too cold this time of year?—J. N. Barger.

In taking the northern route to California it will be remembered that winter sets in early in the Sierra mountains, and on account of the snows it will be found difficult to get through later than the middle of October. In speaking of the transcontinental highways this is mentioned as



STEEP WINDING DESCENT 2 MILES LONG NEAR CATTARAUGUS, N. Y.



AT STODDARDVILLE, PA.

the most practical, and the Santa Fe or Old Trails highway as the most scenic and interesting.

Routing to Kansas City by way of St. Joseph, you follow this Santa Fe trail across Kansas, through Emporia, Newton, Hutchinson, Dodge City, La Junta, Colo., and Trinidad, a town-to-town itinerary to Phoenix, Ariz., being followed as given out to an inquirer from Denver, Colo.

You will not strike any bad sand until you reach California, just about at Glomis, where you have to do some low-gear work. It is well to be provided with some narrow strips of canvas to put under the tires to get traction in the worst places.

CROPSEY, ILL.—MANITO, ILL.

Cropsey, Ill.—What is the best route from Cropsey, Ill., to Manito, Ill., and from Cropsey to Danville?—D. E. Crum.

Go directly south until you come to the Bloomington-Gibson City road and follow it west 18 miles to Bloomington, continuing through Danvers, Lilly, Mackinaw, Tremont, Pekin, Manito. Routing to Danville, upon reaching the Bloomington-Gibson City road turn east 15 miles to Gibson City, and 18 miles to Paxton, then south 30 miles to Champaign through Rantoul. Danville is 39 miles east through Urbana, Homer and Catlin. There is another road 3 miles shorter, but only dirt and not so good.

MINNEAPOLIS—LOS ANGELES

South Haven, Minn.—Editor Motor Age—I shall leave Minneapolis November 1, and drive to Los Angeles via New Orleans, Galveston, and El Paso. Will you give me the best routing for that time of year? The answer to Mr. Potts in the September 12 number will be all right from El Paso to Los Angeles.—Frank E. Sutton.

Route first to Waterloo, Ia., 211 miles, through St. Paul, Rosemount, Farmington, Northfield, Dundas, Faribault, Medford, Owatonna, Blooming Prairie, Lans-

ing, Austin, St. Ansgar, Mitchell, Osage, Charles City, Nashua, Plainfield, Erma, Waverly, Janesville, and Waterloo. It is 139 miles to Davenport, passing through Washburn, La Porte, Mt. Auburn, Vinton, Shellsburg, Palo, Cedar Rapids, Marion, Mt. Vernon, Lisbon, Mechanicsville, Stanwood, Clarence, Bennett, New Liberty, Maysville, and Davenport.

Quincy, Ill., is 166 miles distant through a rolling country and the towns of Rock Island, Milan, Swedonia, New Windsor, Alpha, Henderson, Galesburg, Abingdon, St. Augustine, Avon, Prairie City, Bushnell, Macomb, Colchester, Tennessee, Plymouth, Augusta, Bowen, Loraine, Menard, Ursula and Quincy.

St. Louis, Mo., is situated 155 miles south, going first through Illinois to Seehorn and Sheperd, crossing over two bridges to Hannibal, Mo., and running along the river in Missouri to Oakwood, New London, Frankford, Louisiana, Rocky Ford, Prairieville, Auburn, Troy, Flint, Wentzville, Dardenne, Cottleville, St. Charles, Pattonville, Wellston, St. Louis. A day's journey of 169 miles is Maxville, Antonia, Hillsboro, Victoria, De Soto, Bonne Terre, St. Francois, Flat River, Farmington, Valley Forge, Weingarten, New Offenburg, Ste. Genevieve, Perryville, Longtown, Uniontown, Appleton, Fruitland, Jackson, and Cape Girardeau. To Jonesboro, Ark., you have gravel and dirt roads 154 miles, through Dutchtown, Allenville, Aquilla, Bloomville, Dexter, Campbell, St. Francis, Piggott, Rector, Marmaduke, Paragould, Brookland, and Jonesboro. Memphis is 119 miles distant and for the most part over quite poor roads, the towns being Greenfield, Harrisburg, Whitehall, Wynne, Forrest City, Madison, Marion, Mound City, and ferry over the Mississippi river, following the trolley into Memphis.

The No. 5 Blue Book can be used for running directions until Memphis is reached, when the No. 3 is taken up. The National tour, formerly known as the Glidden, is to travel from Memphis to New Orleans over the same route we are giving you. The trip is divided as follows: To Sumner, 120 miles, the towns are Lynchburg, Lake Cormorant, Clacks, Robinsonville, Hollywood, Tunica, Evansville, Clayton, Dundee, Rich, Coahoma, Cloverhill, Clarksdale, Tutwiler, Sumner; to Jackson, Miss., 165 miles, pass through Whitehead, Glendora, Schlater, Greenwood, Lexington, Franklin, Goodman, Pickens, Canton, Madison, Ridgeland and Tougaloo; to Baton Rouge, La., 179 miles, is Terry, Crystal Springs, Hazlehurst, Beauregard, Wesson, Brookhaven, Norfield, Johnston, Osyka, Kentwood, Greensburg, Baton Rouge; then New Orleans, 119 miles, through Darrow and Kenner.

Heading west through Louisiana the following towns offer the best roads such as they are: Westwego, Hahnville, Edgard, Donaldsonville, Thibodaux, Schriever, Houma, Gibson, Morgan City, Franklin,

Jeanerette, New Iberia, Lafayette, Crowley, Midland, Jennings, Lake Charles, Orange, Tex.

To reach Galveston you should route through Beaumont, Liberty, Houston, Harrisburg, Genoa, Webster, League City, Dickinson, and Lamarque. Return to Houston and follow through Hemstead, Brenham, Austin, Georgetown, Burnet, Lampasas, Ballinger, San Angelo, and then the directions given in the September 12 issue can be used. However, instead of routing from Lordsburg, N. M., to Bowie, Benson, Tucson, etc., the best and easiest route is via Douglas, Bisbee, Hereford, Huachuca, Tucson, Florence and Phoenix, as given in the story written by W. T. Rand, of El Paso.

MELLOTT, IND.—MUNCIE, IND.

Mellott, Ind.—Editor Motor Age—I am going to make a trip to Muncie, Ind., and would like the most direct route.—Wm. J. Mellott.

Go to Hillsboro, and, as outlined in the Blue Book, the route extends 15 miles to Waynestown and Crawfordsville, then 46 miles to Whitesville, New Ross, Jamestown, Pittsboro, Brownsburg and Clemont. You have a choice of two roads to Muncie, the shorter having numerous turns and routing through Oakland, McCordsville, Pendleton, Anderson and Muncie, with a mileage of 62 miles, as against 67 miles through Cumberland, Greenfield, Maxwell, Pendleton, Anderson and Muncie. Either road is good gravel.

WOULD REPEAT JOURNEY

Randolph, Wis.—Editor Motor Age—Last year I took a trip to Palacios, Texas, outlined in Motor Age in the issue of October 5. This same trip is to be repeated, and I would like to know if any changes should be made in the itinerary.—J. L. Richards.

Motor Touring Conditions

THE Blue Book car has just returned to the Chicago office after completing a 6,500-mile trip in Indiana, Ohio, Kentucky and Illinois.

A new route is Nashville to Paducah via Clarksville, Ky. First few miles out of Nashville are excellent macadam. Rest of the way are natural dirt roads with very little improvement. These roads are none too good for the most part, but even so, this route is much better than the Louisville-Nashville route. There are two or three small fords which will give no serious difficulty except in very high water. The trip should not be attempted in wet weather due to the slippery clay soil which in some cases would make it impossible to get up the steep climb from one or two ferries.

A new route is Paducah to St. Louis via Anna and Murphysboro. From Paducah the ferry is taken across to the Illinois side and unimproved dirt roads are encountered all the way, some parts fairly good, most of it being pretty rough, due to no improvement and not much travel.

Cairo to St. Louis is new. This is identical with the above route with the exception of the first part to Anna. Blue Book car only covered the connection from Cairo to Cape Girardeau and Cape Girardeau to Anna, making a St. Louis-Cape Girardeau route on the Illinois side of the Mississippi.

St. Louis to Springfield via Alton, Brighton and Carlinville is new. This is over fairly good dirt roads, last part from Alton being quite good. There are a few stretches of fairly bad sand in dry weather between St. Louis and Alton.

A new route is Springfield to Louisiana via Jacksonville and Pittsfield. Road conditions on this route are fairly good dirt all the way with one exception, which is in the bad

For the most part a change would be advisable in the west, not for the reason of finding better roads, but to see a different section of the country.

Undoubtedly you have made the run to Portage and Madison. Between Portage and Madison you will find a little sand, but the last half of the route is particularly good. To reach Dubuque, Ia., you will have some very rolling country and some steep grades 103 miles through Pine-bluff, Mt. Horeb, Blue Mounds, Barneveld, Ridgeway, Dodgeville, Mineral Point, Calamine, Platteville, Cuba, and Dubuque.

The first few miles out of the Mississippi valley are up grade, but the rest is all a level farming section over the Hawkeye highway across the state. Waterloo, Iowa, is 91 miles through Julien, Centralia, Epworth, Farley, Dyersville, Earlville, Manchester, and Independence. It is 111 miles to Fort Dodge and through Cedar Falls, New Hartford, Parkersburg, Austinville, Ackley, Iowa Falls, Alden, Williams, Blairsburg, Webster City, Fort Dodge, to Omaha is 192 miles through Moorland, Rockwell City, Sac City, Early, Shaler, Odebolt, Kiron, Deloit, Denison, Arion, Dunlap, Woodbine, Logan, Missouri Valley, Crescent, Council Bluffs, and following the boulevard over the Missouri river to Omaha.

On the Omaha-Denver transcontinental trail 124 miles to Fairmont, you pass through Millard, Gretna, Ashland, Waverly, Havelock, Lincoln, Emerald, MILFORD, Friend and Exeter, then, following the Meridian road south clear through Kansas, first going 152 miles to Salina, through Geneva, Strand, Brunning, Belvidere, Hebron, Chester, Belleville, Concordia and Minneapolis. The Kansas-Oklahoma state line is then reached through Bridgeport, Lindsborg, McPherson, Moundridge, Hes-

ton, Truesdale, Newton, Wichita, Wellington, South Haven and Caldwell, with 164 miles of travel.

Through Oklahoma the Meridian road is known as the Chisholm trail. Go through Renfrow, Medford, Pond Creek, Kremlin, Enid, Waukomis, Hennessey, Dover, Kingfisher, El Reno being 126 miles, Oklahoma City lying 27 miles to the east. It is a distance of 157 miles to a crossing over the Red river to Burk Burnett, Texas, the intermediate towns being Pocasset, Chickasha, Verden, Anadarko, Apache, Rohrer, Lawton, Emerson and Randlett.

Fort Worth, Texas, is reached through Burk Burnett, Wichita Falls, Windthorst, Antelope, Jacksboro, Whitt, Adell, Weatherford, Annetta, Aledo and Ben Brook. The balance of the way to Palacios is the same as outlined for you before.

KEOKUK TO ZANESVILLE

Nauvoo, Ill.—Editor Motor Age—I would like to see a route from Nauvoo to Zanesville, O., published. I want to get on the national pike at Indianapolis or sooner if it extends any farther west than Indianapolis.—R. S. Ward.

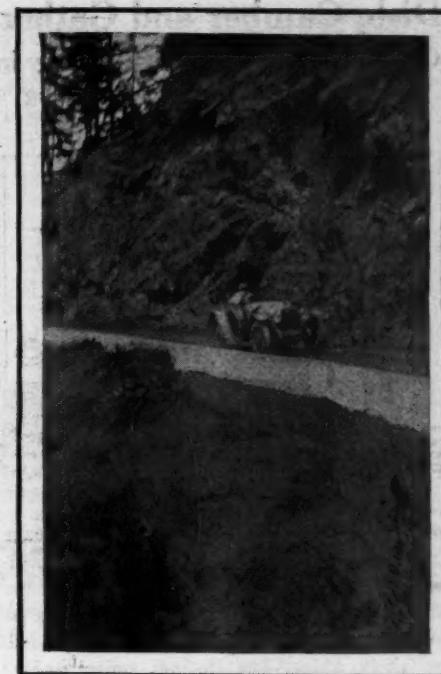
From Keokuk to Quincy it is 38 miles through Hamilton and Ursa, then 120 miles to Springfield through Fowler, Paloma, Coatsburg, Camp Point, Clayton, Mt. Sterling, Ripley, Rushville, Frederick, Bearstown, Virginia, Philadelphia, Ashland, Pleasant Plains and Bradfordton. It is 150 miles to Terre Haute, Ind., mostly over natural dirt roads, through Dawson, Lanesville, Niantic, Decatur, Antioch, La Place, Lovington, Chesterville, Arcola, Oakland, Redmon, Paris, Elbridge and Terre Haute. Then the National pike extends to Indianapolis, 70 miles, through Seeleyville, Brazil, Harmony, Reelsville, Coatsville, Stilesville, Belleville, Plainfield, and 172 miles to Columbus through Cumberland, Greenfield, Cleveland, Knightstown, Ogden, Lewisville, Cambridge City, Germantown, Centerville, Richmond, Gettysburg, Vandalia, Tadmore, Brandt, Donnelsville, Springfield, Harmony, Brighton, Lafayette, West Jefferson, Alton and Columbus. A distance of 60 miles lies between Columbus and Zanesville, which is reached through Columbia Center, Granville, Newark, Hanover, Nashport and Irville.

For running directions you can secure a No. 4 Blue Book.

MADISON, WIS.—DUBUQUE, IA.

Randolph, Wis.—Editor Motor Age—Kindly outline a trip from Madison, Wis., to Dubuque, Ia., thence to Sac City, Ia., Britton, S. D., and returning to Dubuque by way of Tracy, Minn. Also what is the direct route from Britton to Madison?—W. D. Porter.

The road from Madison to Dubuque and Sac City is outlined in this issue in the answer to route from Randolph, Wis., Sioux City is 84 miles west, the road lying through Early, Shaller, Holstein, Cushing, Correctionville, Moville and Lawton. Route 87 miles through Jefferson, Elk



ON THE PACIFIC HIGHWAY

Point, Beresford, Worthing and Sioux Falls. Bridgewater is 41 miles to the west on the Meridian road and you head north on this road through Salem, Madison, Arlington, Watertown, Summit, Peever and Sisseton, 169 miles. Britton is in the next county and about 40 miles.

Routing back over the same road to Arlington, go east to Volga, Brookings, Aurora, Elkton, Lake Benton and Tracy, 230 miles. To reach Mason City, Ia., you will travel 212 miles through Walnut Grove, Revere, Springfield, Sleepy Eye, New Ulm, Courtland, Mankato, Janesville, Waseca, Meriden, Owatonna, Geneva, Albert Lea, Glenville, Northwood, Kentsett, Manly and Mason City. Dubuque is then 172 miles distant, passing through Rockford, Marble Rock, Greene, Packard, Clarksville, Shell Rock, Janesville, Cedar Falls, Waterloo, Jessup, Independence, Winthrop, Manchester, Earlville, Dyersville, Farley, Epworth and Delhi.

As for the most direct route from Britton, S. D., to Madison, Wis., upon reaching Owatonna, Minn., instead of branching south into Iowa, continue east to Eden, Dodge Center, Kasson, Byron, Rochester, Dover, St. Charles, Utica, Lewiston, Stockton, Winona, Witoka, Ridgeway, La Crescent and La Crosse, which will register 125 miles. The La Crosse-Madison stretch is 146 miles through St. Joseph, Middle Ridge, Portland, Cashton, Ontario, Kendalls, Elroy, Union Center, Wonewoc, La Valle, Reedsburg, Abelmans, Baraboo, Sauk City and Madison.

The mileage for your first trip is 1,391 miles and for the second 1,276, and your Wisconsin license will be all that is required in Iowa and South Dakota, but in Minnesota a non-resident courtesy tag, which is good for 60 days, is necessary. The Blue Book contains running directions for both tours.

Dish, Camber and Gather Chicagoan Makes Useful Query in Regard to Angle of Mounting and Structural Differences

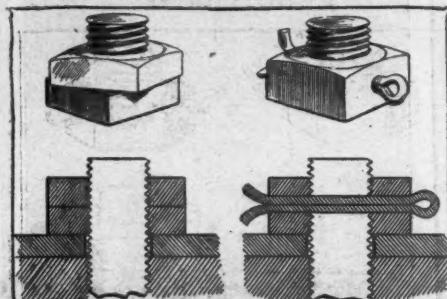


FIG. 1—SIMPLE METHODS OF SECURING NUTS.

CHICAGO.—Editor Motor Age.—Please define dished wheels, set wheels, gathered wheels, and artillery wheels. I am told that these terms refer to angles at which the wheels of vehicles are placed on their axles, but do not quite understand the exact nature of such a manner of applying them. Please also explain the difference between an artillery wheel, such as used on motor cars, and an ordinary carriage wheel. Also why these differences, and manners of applying vehicle wheels exist, and whether artillery wheels should have dish, set, and gather; any or all.—J. W.

1.—Dished wheels are those whose spokes are inclined at an acute outward angle to the spindle.

2.—Set, or properly, cambered wheels are those whose spindles are downwardly inclined, so that in a pair of wheels, so disposed, the upper portions of their tires will be farther apart than the lower portions of the tires.

3.—Gathered wheels are those whose spindles are forwardly inclined, so that in a pair of wheels, so disposed, the front portions of their tires will be closer together than the rear portion of the tires.

4.—Artillery wheels are those whose spokes are set all in a true plane, commonly known by the descriptive term of straight wheels and are usually set as in Fig. 6.

The difference between an artillery wheel and an ordinary carriage wheel is that the artillery wheel is straight, and the carriage wheel is dished. The term artillery comes from their origin. The wheels of gun trucks must withstand great loads in a vertical direction, but are required to stand but little side strain.

Dished wheels were evolved in carriage practice, to enable a pair of wheels to withstand the side strain imposed upon them by centrifugal force in turning corners, and still keep their weight low. The inclination of the spokes transmits outside thrust endwise, through the spokes to the hub, so that the spindle collar absorbs it, instead of the whole strain being taken by the spokes themselves. Of course only the outside wheel takes the thrust for a

The Readers

What, Why and Wherefore of Oblique Wheel Setting Explained for Windy City Reader—Foreigner in Chicago Wants to Know Regulations Controlling Traffic

given pair of wheels, but owing to the disposal of the thrust, the strength of a dished wheel in this direction is more than equal to the double strain.

This dishing, however, as it strengthens the outside of the wheel, so weakens the inside. If a dished wheel is set on a horizontal spindle, the vertical or load thrust is brought to bear at a sideways angle to the spokes, on the weak side of the wheel, and the tire is brought into contact with the road at an angle. To overcome this difficulty, makers camber the dished wheels, Fig. 5, which brings the spokes vertical to the road, so that the load is taken endwise of the spokes. This, in turn gives rise to an unbalancing of the wheel, so that it would normally run in an outward circle, and if restrained from so doing by mounting it in parallel with its mate, the tire would undergo a constant grinding, such as a straight artillery wheel would be subjected to, if run continuously in a circle. To overcome this, the wheels are gathered at the front,

tion to the spokes, which makes the wheel strong enough to withstand the strain of both wheels better than each could, were they parallel. Owing to their small size, as compared with carriage wheels, it has never been to any extent seriously considered necessary to dish the wheels of a motor car; and inasmuch as such dishing must be accompanied by corresponding camber and gather, it offers difficulties in the construction of the live rear axle that all but preclude it, and it is hardly thought worth while to do so only on the front wheels.

AUTOCRAT ANSWERS

KNEDDY, Minn.—Editor Motor Age—I have any amount of trouble in starting a 1911 Olds Autocrat on cold mornings. What is the construction, theory and value of the fire screen in the carburetor?

2.—We use the Bosch high-tension dual system, and sometimes when the batteries do not work, by switching to the magneto and placing the spark lever way up, the car can be cranked with a few brisk turns. Why do we not get a kick?

1.—The Oldsmobile Autocrat is equipped with an air shut-off which should be employed to facilitate starting on cold mornings. The fire-screen formerly used on Oldsmobiles was for the purpose of breaking up the gases in case of an intake backfire, and preventing injury to the carburetor. It was made of 16-mesh bronze gauze, but owing to the necessarily fine mesh, requisite to accomplish the purpose for which it was designed, it has been found to survive but few backfires before going to pieces and demanding instant removal, to prevent injury being done to the motor. This is a difficult and troublesome task, and for these reasons its use has been abandoned on that car.

2.—If you do not get a kick when you crank with an advanced magneto spark, your timing is off. Retime your motor, so that the retarded spark occurs on dead center, get your batteries in condition, and do not try to crank your motor with an advanced spark. An Autocrat kick is a serious matter. Like mules, motor that will not kick when tempted, are sick.

INTERESTED IN THE JACKSON

CHICAGO, Ill.—Editor Motor Age—What is the weight of an unequipped Jackson 52, five-passenger touring car?

2.—Of what make is the differential and what is its weight?

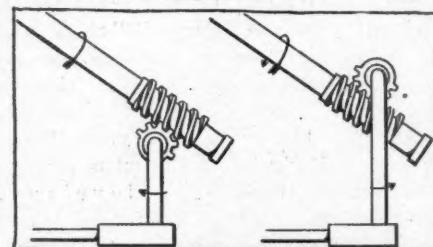


FIG. 2—HOW ACTION OF STEERING GEAR MAY BE REVERSED BY LINKAGE

which overcomes this tendency, and eliminates the grinding, by causing the tread to contact with the road at its center instead of at its side. A wheel so set will run in a straight course, with a true rolling road contact.

It is an open question whether artillery wheels should be disposed with camber and gather. Of course an artillery wheel, by its very nature cannot be dished. Certain it is that camber without gather is a dynamic error. The tire of a cambered, but not gathered wheel is subjected to a constant grinding and does not run on the middle of its tread, subjecting it to strains and wear for which it was not designed.

The advantages of camber with a straight wheel are that owing to the angle of incidence with the road of the spokes, centrifugal thrust in rounding curves is resisted by the spokes of the inner wheel, to a certain extent in a longitudinal direc-

Clearing House

Willys Built Six—All That Is Benz is Not Blitzen—Steering of Oldfield's Freak Is Like Standard—Once a Steamer Always a Steamer—Unequal Carbonization Explained

3—Who is the Chicago representative of the differential maker?

4—What is the brake-test horsepower of the above mentioned car?

5—How can a clutch be remedied which slips if the speed surpasses 35-38 miles?

6—Is it permitted in Chicago to pass a street car on the left-hand side if she is discharging passengers?—Foreigner.

1—3,000 pounds.

2—The differential is furnished by the Weston-Mott Co., Flint, Mich. It weighs 900 pounds.

3—Weston-Mott Co., 140 S. Dearborn St.

4—The model 52 motor delivers a little over 52 horsepower on the brake.

5—Slipping clutches are the result of a number of causes. In any clutch, slipping will be the result of too light adjustment, a weak spring, or disalignment of the clutch members. In cone clutches slipping may be induced by worn facing, oily friction surfaces, or burned cork inserts. In a multiple disk clutch, slipping may be the result of excessive lubrication, or glazed disks. In dry disk clutches, the latter cause may obtain, the disks may be oily, the facing may be worn, or the cork inserts, if used, may be burned. In the case of an expanding ring or shoe, the slippage may result from a worn ring or shoe, excessive lubrication, or wear on the expanding elements. Slipping in all clutches will result if the clutch pedal is allowed to strike the foot board on its back stroke.

6—No.

CENTER CYLINDERS CARBONIZE

Agricola, Kas.—What causes the two center cylinders in my four-cylinder Overland to carbonize and foul worse than the other two, which give no trouble? If I keep the valves soaked with kerosene or some carbon remover, they work without missing. Why does the carbon pick on the two center cylinders, without bothering the others?—A Reader.

As you do not state what year's model your Overland is, it is hard to say how to proceed to provide the proper lubrication. If the mechanical oiler is used, however, it will only be necessary to cut down the oil in the individual leads to the cylinders that give the trouble. If the splash system is used, the spoons on the connecting rods should be filed off until the oil is cut down to the proper amount. It may be necessary to even cut them off altogether. If the proper body of oil is used, this should not be

necessary, if the pistons and rings are tight. If new rings are fitted and holes drilled in the piston walls, below them, to facilitate the return of surplus oil, the engine will not burn so much oil, and carbonizing will cease. As all four cylinders splash their oil from the same level, the fact that only the center cylinders receive a surplus of lubrication, indicates that these two are allowing too much oil to slip past their pistons sometimes.

STEAMER CANNOT BE CONVERTED

Lewis, Kans.—Editor Motor Age—I have a White steam car, model 00, 1910, with body and chassis all in fine shape. I have been thinking of putting in a gas engine. In doing this it will be necessary to change the differential or get a gas engine that turns the opposite direction to the gas car. I would appreciate your advice on the subject.—J. F. Malin.

It is impracticable to convert a White steamer into a gasoline car. The engine is a left-handed, or anti-clockwise type,

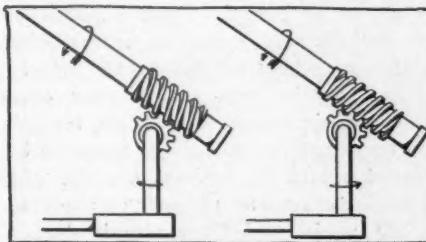


FIG. 4—TWO BETTER WAYS OF LOCKING NUTS

which renders the rear axle useless with any standard right-hand gas engine. The engine mountings are so different from the mountings for a gas engine, that the frame would have to be altered in this respect, and to accommodate a gear-set and clutch. The White condenser could not be used for a radiator, which necessitates the purchase of this additional expensive part. The parts discarded would be pure waste, as there is no market for them. The expense of adapting this car to a gas engine would be greater than the purchase price of a lighter and better adapted car than the product of your efforts would produce. If the car is in good condition, run it as a steamer, or sell it, or trade it in, to assist you in the purchase of a gas car, if you prefer not to attempt the operation of a steamer.

Steering of Rear Wheels

Georgian Draws Wrong Conclusions Concerning Control of Christic Racer

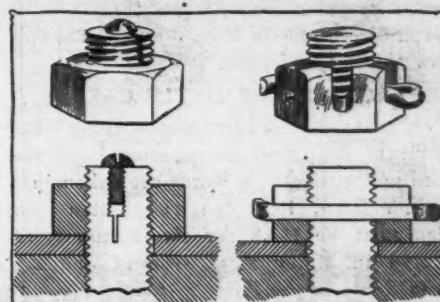


FIG. 4—TWO BETTER WAYS OF LOCKING NUTS

ATLANTA, Ga.—Editor Motor Age—If I am not mistaken Motor Age made a mistake in its answer to J. H. Strickler's fifth question in the September 12 issue. The question was whether or not the Overland Motor Car Co. ever marketed a six-cylinder car. Motor Age's answer was "No." I should like to correct this by saying that in 1908 the Overland people put out three models, namely, models 30, 31 and 34. The first two were fours, while the latter was known as the Willys-Six Overland. I do not remember the exact dimensions, but I think the cylinders were 4 by 4½ inches with three-speed selective transmission, and leather-faced cone clutch.

2—What are the dimensions of the new Blitzen Benz, variously called Blitzen II and Jumbo Benz?

3—In an argument over the big Christie racer I have contended that inasmuch as the car is steered by the rear wheels, the steering wheel must be turned in the opposite direction from the desired direction of travel; that is, in making a right turn the steering wheel is turned to the left and vice versa. Am I right?—J. N. Brightwell.

1—On inquiry, Motor Age finds the above statement is true in part. In 1909 about 100 sixes were built by the Overland company under the name of the Willys six. These cars had cylinders 4 inches by 4½ inches, and used a thermo-syphon cooling system. The wheelbase of this car was 125 inches, and the tires were 36 by 4½ inches. A multiple-disk clutch was used, and an option of a planetary or sliding gear gearset was offered. The body types were a five-passenger tourist, a four-passenger, and a two-passenger roadster. They were marketed as an experiment, and were discontinued because the market was not ripe for them. It is rumored that the manufacture of sixes is to be undertaken again by the Willys-Overland Co.

2—Blitzen Benz, Lightning Benz, Jumbo Benz, etc., are names applied to separate and distinct cars. Blitzen Benz is the car that Burman used in his famous 141-mile-an-hour ride. Lightning Benz is Oldfield's car and Jumbo Benz and Blitzen

II. are still other cars. The motor of Blitz Benz is 7.2835 by 7.8741 inches, while that of Jumbo Benz is 7 $\frac{3}{4}$ by 9 $\frac{3}{4}$.

3—There are no grounds for your contention, as a steering gear may be so threaded or linked as to act upon its connections either way, when turned in a given direction. In Figs. 3 and 4 is shown how this may be done.

DISPLACEMENT OF LITTLE CARS

Sherrard, Ill.—Editor Motor Age—What is meant by piston displacement? If the bore and stroke of a motor are taken into consideration, how can the piston displacement be 154.8 for the Flanders, as figured in Motor Age, issue of January 4, 1912, while the Krit, with larger cylinders, is figured at only 132.7?

2—In fixed spark ignition, as practiced on a number of cars, is there any system used of advancing the spark automatically, or does the fact that at higher speeds, a fatter spark alone, solve the problem?—C. E. and A. G. Peterson.

1—Piston displacement is the volume displaced by the cylinder in its stroke. It is found by multiplying the piston area by the stroke. The piston displacement given for the Krit car in the issue of which you speak is wrong, it should be 176.7 cubic inches. The displacement for the Flanders is correct.

2—The term fixed spark means exactly what it implies, although there are non-adjustable spark systems that automatically advance the spark. In fixed spark systems, the spark occurs usually at dead center, and remains there at all times. The relatively greater intensity of the current at high speeds reduces the lag in ignition, and thus brings the actual ignition nearer the timing at high speeds than at low speeds. Of course a fixed spark system never permits of actual advance, and is used only where the greater efficiency and economy of the adjustable spark or automatic spark is not deemed necessary, or where the skill of the operator is not great enough to warrant the use of an adjustable spark. The terms non-adjustable and fixed as applied to spark systems should not be confused, the one is a negative term that embraces both fixed and automatic-advance systems, while the latter applies only to systems wherein the timing is constant.

DISBROW'S JUGGERNAUT DISSECTED

Carrollton, Ill.—Editor Motor Age—Is the motor in Disbrow's Simplex Zip a two or a four-cycle?

2—Was Disbrow's Jay-Eye-See constructed by the J. I. Case Threshing Machine Co., Racine, Wis?

3—What are the specifications of the Jay-Eye-See motor?—A Reader.

1—The motor is a four-cycle Fiat.

2—No.

3—9 $\frac{3}{4}$ inches bore by 8 $\frac{5}{8}$ inches stroke, four cylinders, cast in pairs with valves in the head, Rayfield carburetor, Bosch double ignition, force feed lubrication, and water cooled.

Differential Bolts Loosen Native Son Finds That Vibration Loosens Nuts on Car's Axe Housing

LOS ANGELES, Cal.—Editor Motor Age—I have a 1910 Chalmers which has given me most perfect service except for one point, and that is the trouble I have in keeping the bolts tight which hold down the cap over the differential gears. I have used the largest lock washers obtainable, using plain washers with them as well, and have inquired of other Chalmers owners, but to no avail. What is the cause of this?—A Constant Reader.

The loosening of the nuts on the differential housing is not unusual in any car, as the vibration on the heavy unsprung portions of a vehicle is always severe and is aggravated by worn threads or an ill-fitting cover. There are several ways in which nuts may be locked securely. Manufacturers sometimes make provision of this kind by either wiring the nuts on, using castellated nuts and cotters, or fitting double or lock nuts.

In case there is not sufficient thread projecting above the nut to accommodate an additional lock nut, the nut may be sawed in half with a hack-saw, and the parts screwed on again, the lower nut being drawn up as tightly as possible, and the upper afterwards drawn down over it.

Another simple way in which a nut may be locked, without removing it from the bolt is to drill a hole through it and the center of the bolt, inserting and spreading a cotter-pin. This and the first method are shown in Fig. 1. These methods do very well for some cases, the former being satisfactory where no great strain is to be imposed on the nuts, as in your case. The second is well enough where the job is to be permanent, but if the nut is to be removed again, the chances are that the holes will not register properly on applying the nut again, and there also is danger of mixing the nuts of different bolts, thereby bringing the holes wrong altogether, as it is unlikely that any pair of hand-drilled

holes would be similar to one another.

Two other methods, more complicated, but not possessing these drawbacks, are shown in Fig. 4. The first is not as difficult as it appears. The bolt is sawed down as shown past the lowest thread in contact with the nut, and tapped a trifle undersize for a standard size round or filister-head machine screw, the edges of the slot being dressed off with a file. The nut is then screwed down and the screw turned down in the threaded slot. This will expand the bolt, and lock the nut. The last method, and by far the simplest and best, may or may not be adaptable to your case. This consists of using a cotter and castellated nut instead of the plain one, and involves only the drilling of the bolt. A handy mechanic can, of course, castellate a plain nut, if you cannot obtain a castellated one of the right size.

OLDSMOBILE ADJUSTMENTS

Chatham, Ontario, Can.—Editor Motor Age—I have an Oldsmobile Special touring car, 1910 model, and it has a pressure fuel system, but the gasoline tank is under the front seat. Why is the pressure system necessary?

2—Sometimes, when driving this car, there is a very strong smell of gasoline. I cannot find any leak. Where does this odor come from?

3—How can I adjust the coil on this machine so that the motor will start when I crank? As it is now, I have to crank the motor two or three times, then go around and press the button on the coil before I can get a spark in the cylinders. It is a Bosch magneto coil.

4—Will you please tell the best way to adjust the carburetor on the car, also the steering gear?

5—Could I use a KW. low-tension magneto for electric lights? How many and what candle power, if I use only for lights?—Bill.

1—Pressure was installed in the fuel line of some Oldsmobile Specials to enable them to use a certain carburetor which required more pressure than the gravity feed could give.

2—If you are sure that there is no leak

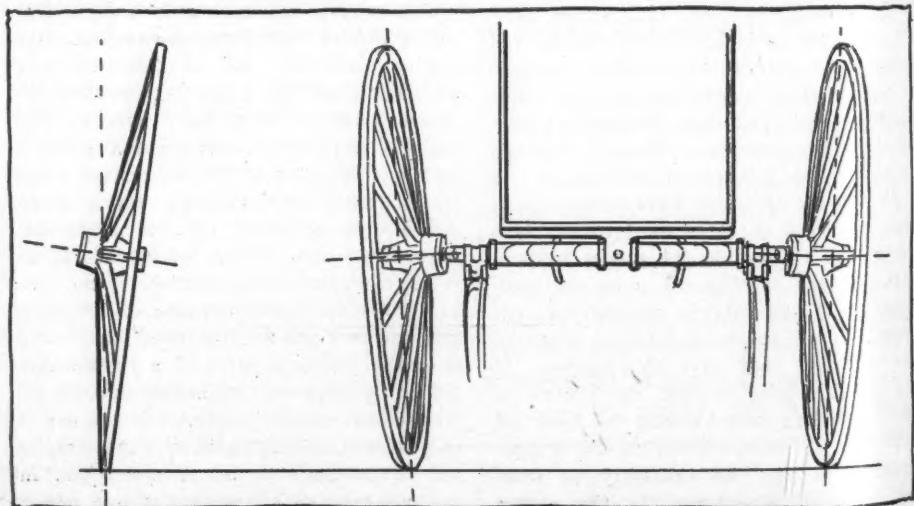


FIG. 5—CARRIAGE WHEELS WITH DISH, CAMBER AND GATHER

the gasoline smell of which you speak must be the result of an over-rich mixture.

3—The Bosch magneto coil used on this model is the old-style upright type, and has a vibrator on top. If you are sure that your batteries deliver consistently 6 volts, this must be out of adjustment.

4—The regular Oldsmobile carburetor is adjusted mainly by means of a gasoline adjustment at the right of the body. This should be turned all the way to the right, which cuts off the gasoline supply, then turned back two and a half turns. The motor should then start, after which, with the spark retarded and the throttle down, it should be turned to the left or right, as conditions require, as experiment will determine, until the motor ceases to spit. The air is adjusted in the usual manner, by means of the nut below the air inlet, directly below the valve. If a Rayfield is used, reference should be made to the Readers Clearing House in Motor Age, August 1, 1912, or to a special article which appeared in the issue of Motor Age May 23, 1912.

5—The K-W model UL magneto, which is usually used for lighting, will furnish enough current for two 20 candle-power head lights, and a small tail lamp, in addition to ignition. If no current is used for ignition, this current would probably be sufficient for two side lamps in addition to this.

FORD GEAR RATIOS

Ankeny, Iowa—Editor Motor Age—Will Motor Age please tell me the gear ratio of the Ford model T, on both speeds and reverse?

2—Is it true that the Krit is what was formerly known as the Columbia?

3—What are the Ford specifications for 1913?—R. W. Taylor.

1—3 7-11 to 1 on high, 7 to 1 on low, and 11 to 1 on reverse.

2—No. The Columbia is made by another concern and is one of the oldest makes in the country.

3—The Ford Motor Co.'s model or models for 1913 have not been announced. The Ford company is not an advocate of yearly models.

Carpenter on Steering

Minnesota Expert, After Experience With All Types, Favors Non-Irreversible Form

SAUK CENTER, MINN.—Editor Motor Age—I have used the styles of steering gears of which I am going to write, and am pleased to note that the one mentioned first has proven to me in a hundred ways to be the best of the three types mentioned. The reversible, semi-reversible and the irreversible are the ones in the most general use, and the semi-reversible is the most common.

The reversible is my choice, for the reasons I am sure will be clear to the motorist who never has given the subject a single thought, but whose very life depends to a very great degree upon the strength and ease of operation of this most important part of a motor car. The reversible gear is so arranged and constructed that it may be easily turned from the steering wheel, and when you take hold of one of the front wheels you can easily turn the steering wheel by either pulling or pushing on the wheel. The semi-reversible is nearly like the irreversible, and need not be mentioned in connection herewith. It is seldom specified, but often used.

The irreversible is an arrangement with bevel and worm-cut gears so arranged that in order to turn the course of the car from a straight line ahead one must exert a considerable power upon the steering wheel, in order that the car may turn as desired, and at the same time it is much slower in action than the reversible gear. This makes steering upon a stony road or one rough with humps and bunches a great deal harder than with the less complicated reversible gear, and it is as easy to guide as eating strawberry short-cake, or ice cream, as our hired girl used to put it.

The slightest touch of the wheel is so very easily done that even with the present enclosed mudguards one is enabled to avoid the most minute obstruction which may be in the road, when one is setting the clip in good earnest. This is not pos-

sible with the heavy, complicated, awkward arrangement called irreversible, and one has but to turn to the bicycle to verify the easy touch given to the handlebar of this machine, as well as its relative, the motorcycle. Still, they are both ridden at times with hands off, so easy is it for the machine to keep a straight line ahead on good roads. Again, if one is on a rutty and badly cut up road, the reversible gear is far the best, as the tires will, so to speak, guide the car much easier and with less skidding off the sides than with the other gear, for the logical reason the tires are not held so tightly to the hard, dried sides of the ruts, but slightly give as the wheel is propelled forward, thereby reducing the grind on the soft rubber sides of the tires to the minimum. It is also an admitted fact that only with a reversible may the car tracks be followed.

As to safety, I feel certain that the quickness of the action of the reversible gear gives far greater chance to avoid a collision with another car or any obstruction which might be avoided by a quick turn of the wheel, which would not be possible with the slower moving gear. I notice that some of the leading builders have used the reversible gear from infancy to the present day, proving that their machines are on the job as to durability and ease of operation of this important part of their cars. Among these makers are some who build even the largest and heaviest cars.

Further, it is much easier to keep in order, and is most certain to outwear the more cumbersome gear, and the wheel can be kept tighter with less play at practically no expense, whereas the cut gears to be found on the irreversible type are often so badly worn that replacement at considerable cost must be had. I owned a heavy car which had the irreversible gear, and at first the gear was tight and but little play at the wheel, but shortly there was a noticeable looseness and hard steering that I did not like. There would be about 3 or 4 inches that one could turn the wheel before it affected the front wheels in the least, which made steering tiresome, and unsafe, as well. Such lost motion rarely develops in a reversible gear.

In the car I now own I keep the steering wheel just so it does not bind, and there is scarcely a particle of play to it. This makes driving an easy matter, as well as a real pleasure. But more than anything else, it makes steering safe.

The adjustability of the reversible gear is what commends it to me, and the easy manner in which wear, when it occurs—which is very seldom—may be taken up, and at no cost whatever except time. Now, like the magneto discussion, let us have the man behind the irreversible gear come forward and explain why it is better than the reversible type.—A. D. Carpenter.

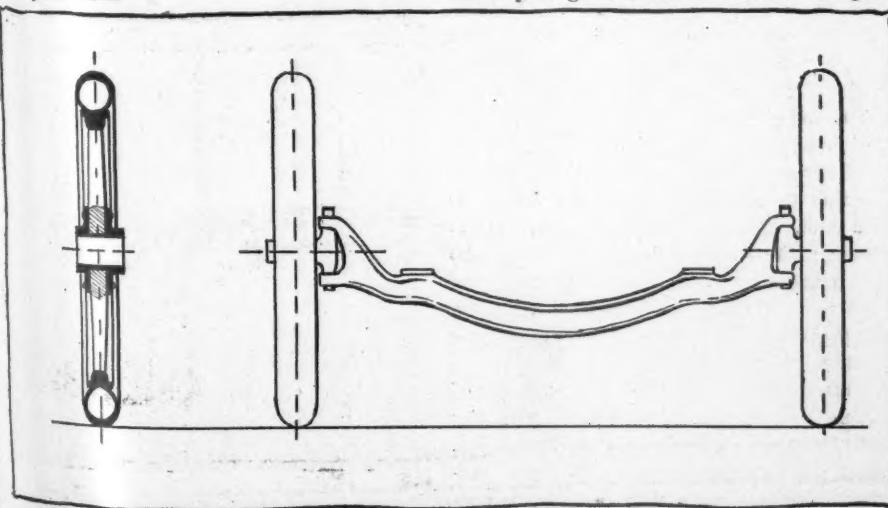


FIG. 6—MOTOR CAR WHEELS, ARTILLERY TYPE, ON STRAIGHT SPINDLES

The Realm of the

Alco Finishes Transcontinental Run



PIERCE-AARROW TRUCK EQUIPPED FOR ARMY MANEUVERS

GREETED by a salute as it entered the city, escorted by a cordon of motor trucks and a platoon of police, and welcomed at the city hall by public officials, the transcontinental Alco truck that has made the first trip on record in actual commercial service arrived in San Francisco September 20 with its cargo from Philadelphia. The truck averaged 45.21 miles per day for 90 days, no deductions being made for Sundays, when it did not run as a rule.

The arrival marked the culmination of a journey that started June 20 from the factory of the owners, Charles W. Young & Co., soap manufacturers of Philadelphia. The vehicle was taken out of its regular daily service, and, laden with a 3-ton consignment for the Carlson Currier Co. silk mills, set out June 20 on its coast to coast journey.

A delivery of 4,069 miles, this trip through fifteen states was fraught with many thrills from the time the truck struck heavy sands in Ohio until it crossed the highest point of the Sierras, and journeyed down the roads of California.

At times the vehicle ran over boulevarded highways. At others it encountered snow storms, cloudbursts, broken bridges and steep grades reaching as much as 20 per cent. It was forced often to pull

through sandy roads 2 feet at times and through alkali mud up to its hubs. On occasions it followed trails that were merely deep ruts with high ground between. Sometimes there were no trails at all when the truck made detours from the beaten path.

Departing from Philadelphia, after heading a parade in which more than 500 vehicles joined, the truck checked in at New York the first night of its overland journey, and continued through the state by way of Albany, Schenectady, Utica, Syracuse, Rochester and Buffalo; thence across northern Pennsylvania by way of Erie into Cleveland.

The route from here led to Toledo, where the first experiences with roads in deep sand were met. Rains the following day on the way to Edgerton, O., turned the going into mud. Across western Illinois, beyond Chicago, the Alco ran into roads of gumbo that wrapped around the wheels and gave tests to the truck's pulling power. Many sharp grades had to be climbed in reaching Clinton, Ia.

The journey across Iowa by way of Boone and Arion was accompanied by many thrilling experiences with bridges, which were the weakest in any state traversed. Several gave way, and in 3 days at least 500 were inspected by the crew;

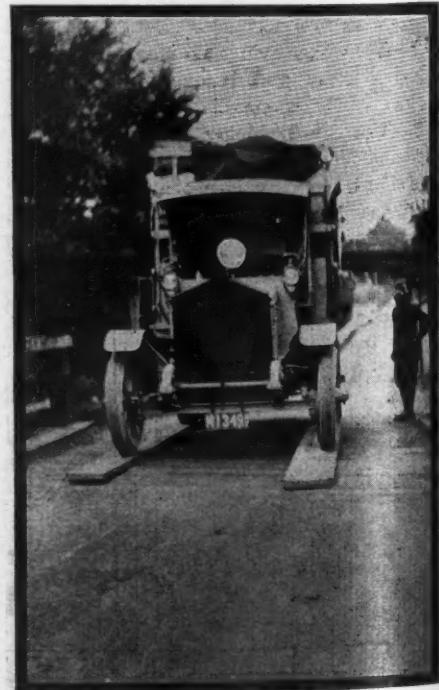
Trip from Coast to Coast Ends in Los Angeles on September 20

100 were replanked, braced or given other attention.

Conditions in Nebraska were ideal by comparison with what the truck had just pulled through, the roads being better and the bridges stronger. Most of the way across the state the crew were guests of various road boosting associations.

Near Sterling, Colo., the vehicle was engulfed in a sea of alkali mud when the huge irrigation canal in that section of the country overflowed. Trapped for 27 hours, the crew were without food and cut off from communication with the world.

Even worse experiences were the almost daily program across Wyoming, which proved by far the most difficult in negotiating. In 8 days there were ten cloudbursts in one section and the roads at best were merely trails too narrow for the truck. There were some gullies as deep as 14 feet, which the truck was forced to cross.



PIERCE PREPARING TO CROSS RE-INFORCED BRIDGE

Commercial Car

Pierce-Arrow Tested in Army Maneuvers

Recent Run Across Country Different from Foreign Military Practice

A PIERCE-ARROW 5-ton worm-drive truck ran from Buffalo to Connecticut, took part in the army maneuvers and returned to Buffalo overland. Nothing approaching so severe a test as this for motor trucks in army field work has been attempted by any of the great foreign nations. England, Germany, France and several other European countries have, for years, used motor trucks in field work during maneuvers and have been close observers of their capabilities. They, however, have used trucks only at the actual scene of the maneuvers. No long overland trips have been included in the run, as there has been little necessity for them.

The Pierce-Arrow truck took the roads as they came. A goodly percentage of the mileage was made, both coming and going, over state roads whose condition was good, but a large portion of the trip to and from the maneuvers was made over country roads that could not be boasted of.



REMOVING PLANKS AFTER CROSSING
BRIDGE

ITINERARY OF PIERCE-ARROW MILITARY TRUCK BUFFALO TO NEW HAVEN

Date and Place	TIME	Time, hours, including all stops	Miles per hour	Gallons of gasoline put in tank	Cost of gasoline	Quarts of oil	Cost of oil	Total cost	Average load	Loads carried, approximate
Aug. 4—Buffalo to Rochester	80	8.75	9.14	20.5	3.80	...	...	3.80	7,776	...
Aug. 5—Rochester to Syracuse	102	14.5	7.03	24	3.60	6	.90	4.50	8,000	...
Aug. 6—Syracuse to Albany	147	17.5	8.40	32	5.40	...	...	5.40	8,000	...
Aug. 7—Albany to Lee, Mass.	48	8.25	5.82	5	.75	1	.13	.88	8,000	...
Aug. 8—Lee to New Haven	111	14.75	7.53	24	3.60	3	.36	3.96	8,000	...
Total for 5 days.....	488	63.75	7.6	105.5	17.15	10	1.30	18.54	7,975	...
				Miles per gallon, 4.63						

WAR MANEUVERS

Aug. 9—Tyler City	12	...	...	...	...	...	...	...	8,000	...
Aug. 10—New Haven to Tyler City	23	...	...	...	...	...	...	...	6,000	...
Aug. 11—Tyler City to New Haven	21	...	...	13	1.95	2	.25	2.20	3,000	...
Aug. 12—Tyler City to Orange Center	20	...	...	...	...	...	...	...	6,000	{ 12,000-1
Aug. 13—Orange Center to New Haven	23	...	...	15	3.00	...	...	3.00	2,000	{ 4,000-2
Aug. 14—Orange Center to White Hills	32	...	...	10	2.00	...	...	2.00	11,000	{ 2,000-3
Aug. 15—New Haven to White Hills	38	...	...	12	2.40	2	.25	2.65	2,000	{ 13,000-1
Aug. 16—White Hills to Oxford	30	...	...	10	2.00	...	...	2.00	14,000	{ 6,000-2
Aug. 17—White Hills	11	...	...	17	3.40	...	...	3.40	14,000	{ 3,000-3
Aug. 18—White Hills to Botsford	14	...	...	...	...	...	...	...	5,000	Rain
Aug. 19—White Hills to Derby	8	...	...	12	2.40	1	.13	2.53	2,000	Rain
Total for 11 days.....	232	...	...	89	17.15	5	.63	17.78	6,635	...
				Miles per gallon, 2.6						

NEW HAVEN TO BUFFALO

Aug. 20—White Hills to Springfield	79	10.	7.90	20	3.00	6	.72	5.52	6,500	...
Aug. 21—Albany	94	11.	8.54	12.5	1.88	...	1.88	6,500	...	...
Aug. 22—Utica	97	10.25	9.46	30.5	4.73	3	.36	6.08	6,500	...
Aug. 23—Auburn	80	9.	8.88	16	3.20	...	...	3.20	6,500	...
Aug. 24—Rochester	71	8.	8.88	18	3.60	...	...	3.60	6,500	...
Aug. 25—Buffalo	87	8.	10.88	19	2.85	3	.36	3.21	6,500	...
	508	56.	9.03	115.0	19.26	12	1.44	22.50	6,500	...
				Miles per gallon, 4.42						

Gasoline \$19.26
Oil 1.44
Grease 1.80

Total \$22.50

Buffalo to New Haven	488	...	...	105.5	17.15	10	1.39	18.54	8,000	...
War maneuvers	232	...	...	89	17.15	5	.63	17.78	6,635	...
New Haven to Buffalo	508	...	...	115	19.26	12	1.44	22.50	6,500	...

Grand total 1,228 Miles per gallon, 3.97

SUMMARY OF RESULTS AND NOTES

Number of days in service	22
Average load carried (daily), pounds	7,045
Total distance covered, miles	1,228
Average daily mileage, miles	55.8
Gasoline consumed (gallons)	309
Miles per gallon gasoline	3.97
Oil consumed (27 quarts)	6.75
Miles per gallon oil	182

During the actual maneuvers back roads were used almost exclusively by the truck. It was known before the truck left the factory at Buffalo that difficulties would be met with because of the nature of the roads that would be used necessarily and special provision was made for overcoming these difficulties. The Pierce-Arrow truck, then, may be said to have gone into the maneuvers prepared for army field work in so far as foresight and engineering experience could equip them.

Most valuable of the extra equipment of the truck were four heavy planks 14 feet long, 12 inches wide and 2 inches thick. Two of these were carried on each side of the truck and there was not a day the truck was on the road that they were not used. Bad culverts were crossed with their aid and they were laid frequently across weak bridges to distribute the strain that would ordinarily fall on a few floor boards and one set of stringers. On one occasion these boards were used by the whole army train of a dozen trucks.

On the left side of the truck a winch was mounted, connecting with the shaft running between the clutch and transmission. The winch was used on two occasions, but then more as a test of its adaptability than as a means of propulsion.

Mounted on the dash was a searchlight. This it was expected would be employed altogether in lighting the road for night running, but on the first day of the maneuvers another use was found for it. During the unloading of the truck at night on the field the men had been forced, at other times, to work with one hand and arm, using the other arm for holding a lantern. With the searchlight turned around to bear on the load, however, the

men could use both arms for the work. A spare wheel was carried under the rear of the body.

Numerous lessons were drawn from the use of trucks in the recent maneuvers, the most important of which was that the efficiency of the motor truck suffers to such an extent when driven in any army train with mule-drawn wagons as to render it of little more value than its equivalent in carrying capacity in wagons. Where entrained with the wagons, as was considered necessary in order to keep the entire supply train intact and under one guard, the better to resist attack by the enemy, the trucks were forced to limit their speed to that of the mule-drawn wagons. While on the road in train formation stops were frequent and owing to the narrow roads in the country traversed as well as to the train formation it was impracticable for one portion of the train to pass another.

Bridges and culverts, especially on the back roads, were not built to withstand motor truck passage, it soon was observed. At times it was necessary to remove all or a part of the load before a passage could be attempted, while on numerous occasions the planks that were carried were spread across the floor in order to distribute the weight. However, even planks proved inadequate on 1 day's march when a sunken culvert that had been covered over with loose dirt and gravel gave way and the truck sank down on one side to the level of the platform body. There had been no warning sign on the road. As soon as the load was off a score of soldiers who had been on the truck and in the escort ranged themselves on one side of the vehicle and lifted it bodily so the planks could be placed under the wheels and it then pro-

ceeded without further incident. The strain undergone in this accident must have been a tremendous one, but no damage was done.

Army trucks to be successful must be especially equipped for their work, as was shown conclusively. Planks are an absolute necessity. In addition to those carried by the Pierce-Arrow truck there could have been used two others 4 feet long, 12 inches wide and 2 inches thick for bridging short spaces. Among the other recommendations made by an observer were these:

A winch so situated that it may be worked through snatch blocks in any direction.

Strong eye bolts for carrying snatch blocks for the winch line.

Two jacks that are quick acting and with a step that is near the ground. An even better plan is a tripod carrying a long extension lever to use for prying.

A draw bar that carries an eyebolt or coupling that would prevent wear or cutting of the cable used.

A swivel type searchlight.

Shovels and axes so placed that they are not in the way of the load, but where they are accessible for instant use, no matter what position the truck may be thrown.

A double block and tackle with 100 feet of rope.

The actual trip started August 3 with the loading of the truck at headquarters at Buffalo. The Albany armory was reached at 11 a. m., August 6. The return trip after the hard siege of army work was begun August 20, Buffalo being reached at 5:30 on August 25. The work accomplished by the machine is shown in the tabulated results on page 31.

Determining Efficiency Standards of Motor Trucks

By R. W. Hutchinson, Jr., M. E.

NOT an inconsiderable number of motor truck salesmen endeavor to introduce motor transportation by tirades against the horse, forgetting that the horse as a horse is not at fault at all; that he, the horse, is not the cause, but the victim of our changed economic conditions. These superficial promoters of mechanical transportation do not seem to grasp the broader viewpoint in the solution of these problems. This is due in a large measure to the fact that the business world has gotten into the habit of gauging motor truck efficiency and performance by horse-service standards; in comparison with the effectiveness, service, capacity and cost of the horse.

Habit is a basis for most of our methods of doing things, and is too often the wet blanket that smothers the spark of human progress. Today one of the greatest hinderances to the rapid development of the utilization of the motor truck is the prevalence of the horse standard that has been so firmly fixed in the human mind by heredity's influence. This influence is

widely responsible for the prevailing skepticism of the business public towards the motor truck.

As a consequence of unfair horse comparisons, it is harder for the manufacturer to sell power trucks, and it restricts the user to a traditional line of judgment of efficiency ideals which are in most cases incongruous. Both parties are thus losers, as is also the development of the truck. The short-sightedness of dealers who adopt this line of sales policy is thus apparent. The horse standard of efficiency also accounts for much of the false figures of transportation costs and also for seven-eighths of so-called truck failures, which in reality are not truck failures at all but misapplications.

If the horse never had been used by the human race to draw vehicles, the motor truck would now be taken at its true value, and its maker and the man who is, or ought to be using motor transportation,

would be a great deal better off in being able to get closer together, in recognition of their mutuality of interests—their interdependence in the scheme of advancing civilization.

Unprejudiced fairness to the motor truck demands recognition of the fact that the service it does is not comparable with horse service, primarily by the maker and necessarily by the user.

Granting that in average service, one high-grade motor truck will displace four teams, the impression must not be conveyed that it does its work in the horse way, so that the comparison does not strictly obtain. While it renders the same service, it does it in a different and better way—faster, surer, independent of weather extremes, without fatigue, regardless of hours of rest and feed, free from bad temper, occupying less space in the streets, docks, terminals, and in the owner's garage; doing cleaner work, permitting the employment of more skilled and efficient labor, permitting those whose work depends indirectly upon the work of the

transportation means to work to their full capacity, and has almost unlimited capacity for overtime work. It can be taken off the job when the season is dull, with no other cost than the small fixed charges and storage, and again, in both theory and practice, the motor truck never dies. It can be renewed when worn out, and when consistently and intelligently repaired and kept in proper adjustment, can be kept always at a point of maximum running efficiency, so that in truth, a motor truck never need be allowed to even age.

Furthermore the motor truck can deliver goods to restricted places, alleys, docks, platforms, etc., and unload with its own power, where horse deliveries must be confined to places where the horse can go, with loads restricted to the capabilities of the horse, and the unloading done by slow and expensive hand labor. Even a light-duty motor truck will carry as many as four horses, with only one man in charge of it, and with the aid of the readily adaptable power of the motor, can unload more rapidly than can a horse and wagon attended by never fewer than two men.

The Pittsburgh Contracting Co., one of the builders of the great New York aqueduct, is using auxiliary loading and unloading devices, a crane and a derrick, to assist its 6½-ton truck, thus conserving the waste time of unloading and loading by hand. In comparison with horse equipment its economies, due to thus taking advantage of the functions of the motor truck as a power plant outside of its purely carrying capacity, aggregate over 63.75 per cent as the detailed cost in the table data clearly shows. These figures, however, give only a partial idea of the actual economy effected by its use.

Owing to the greatly increased speed of both transportation and handling of the load less time, of both the driver and those whose work depends upon his, is wasted; owing to the absence of fatigue of the truck, this equipment can work more hours per day than is shown in the table, with an actual saving in operating cost; the quality of help is inevitably higher, where the driver is required to have a technical training, a clear head and must work to full pressure to keep up with his mount, than where a strong back and lusty lungs are the chief requisite as with the horse driver; the reliability is greatly increased, the truck offering absolute immunity to weather conditions, except as they may affect traction; and the general benefit to traffic at large accruing as a result of greater speed and less consumption of traffic room; these results cannot be measured by horse standards, and constitute indispensable requisites to a fair consideration on a higher plane of consideration than merely the narrow difference in operating cost between the truck and horse equipment in similar service.

As a traction element, the efficiency of the horse is limited strictly to the drawing

of the load. The traction and carrying capacity of the vehicle only partially represent the capabilities of the motor truck. To bring out the efficiency ideal of the motor truck still further, we must think of the easy adaption of the motor truck to the operation of power winches, cranes, and even taking the crane over a wide distributing area. The power winch equipped truck applies the power which propels the truck to load and unload. The self-same engine that operates these devices also may be applied to a dynamo to drive stationary tools in the shop, the engine's exhaust may be used to warm the truck, to make the driver more comfortable, or prevent the freezing of perishable goods; or in a reverse manner, to operate a refrigeration plant, to protect perishable commodities from spoiling in hot weather.

These subsidiary and constantly increasing and diversifying uses for the motor's power represent quality of service and character of work, for which the horse is useless. The machine performs a class of service in many respects which cannot possibly be done with a horse, and consequently ought not to be judged by horse units.

It must be confessed that today the average motor truck goes into service under horse-pace standards in the smallest details. Its owner, regarding it in the light of horse ideals puts it to work distributing his goods over routes adjusted to horse capacity, thinking of it purely as a substitute for a horse team. He loads it from a platform or a warehouse designed solely for the limitations of the horse team. He unloads it after it has waited its turn for perhaps an hour at a similarly misfit delivery place. The aggregate of its off duty or stationary periods runs into hours per day and when capitalized on its initial cost of \$3,500 as an average represents the dividend-earning capacity of the power vehicle, wasted op-

portunities spell truck failures, so called. Efficiency engineers are daily showing that many of these truck failures are the fault of the owner and not the truck by throwing aside all horse traditions and re-organizing the operating system completely, producing economies afterwards that astound the owners.

The great and fundamental cause of truck failures is the fact that truck users forget that the machine is one of the biggest potential tools for the efficiency in business that the twentieth century has so far given us, and that a new regime must be put into force when he adopts it; and that this regime demands the highest order of systematizing and reorganizing ability for the entire delivery system—inside and outside as well. Grounded deeply in horse traditions, probably but one master of transportation or delivery superintendent in twenty-five is capable of handling such a reorganizing problem. A transportation doctor's services are needed at the start to so plan the system within and without that the modern mechanical wagon can be kept constantly at work.

So far as planning the without part of the new system goes it is the office of the truck manufacturer to supply the education of his customer through his traffic department or efficiency doctors. The within part of the system must come as a process of evolution which motor transportation is bringing. Existing buildings must be altered to facilitate motor truck delivery. Doors must be sufficiently large to allow the entrance and exit of the largest trucks with inclosed bodies; courtways must be equipped with turn tables, traveling belts, movable platforms, slides, chutes and other modern efficiency apparatus for quickly putting the load on and off must be utilized before the potential possibilities of motor transportation can be developed. Even the new highway and street must come.

ECONOMY SECURED BY PITTSBURGHERS THROUGH USE OF TRUCKS

This is an efficiency example from Pittsburgh.

The material is excavated from Aqueduct tunnel and the time of loading and unloading is 3 minutes. The material is dumped into bins and then to buckets by chutes at the shaft mouth. At the dumping ground the bucket is hoisted off the truck and dumped.

CONDITIONS—	50 miles per day.
300 days per year.	3½ yards per trip in single bucket.
15,000 miles per year.	42 yards per day of eight hours.
INVESTMENT—	
6½-ton chassis	\$6,000.00
Special platform body	300.00
	\$6,300.00

FIXED CHARGES—

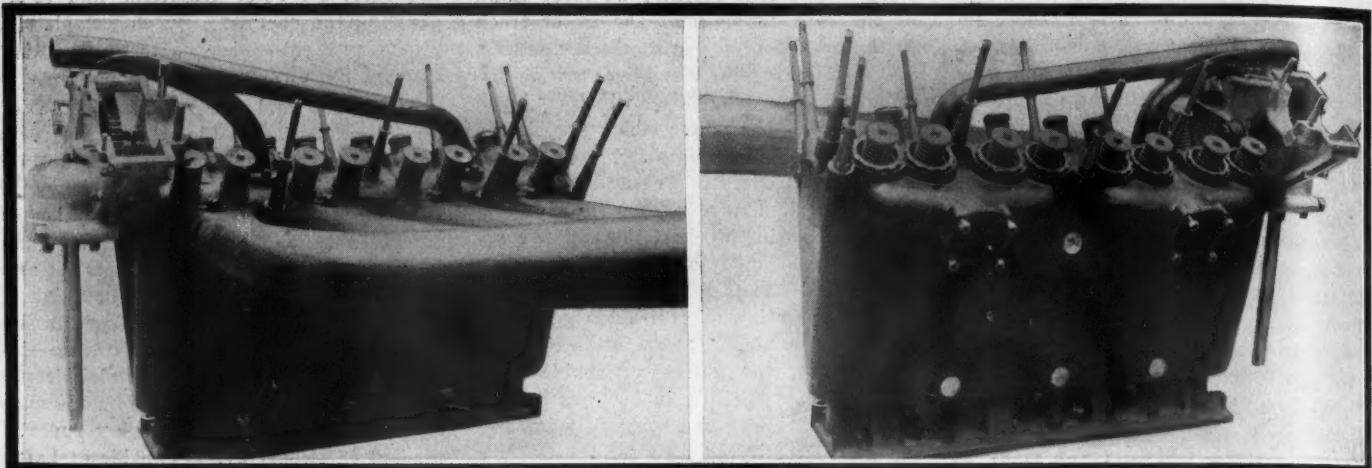
Interest on \$6,300 at 6%	\$ 378.00
Insurance, liability to persons	75.00
Depreciation not figured	
Driver at \$21 per week	1,092.00
Garage at \$17.50 per month	210.00
	\$1,755.00

OPERATING CHARGES—

Maintenance at 4 cents a mile	\$ 600.00
Gasoline at 2.4 cents, at 5 miles to a gal	360.00
Tires at 5.5 cents, 8,000 miles guarantee	825.00
Oil and grease, at 1 cent per mile	150.00
Total cost per annum	\$3,690.00
Total cost per day	12.30
Total cost per yard	0.292
Total cost per mile	0.256

With horse teams it cost 80¢ per yard to haul this material.

Constructional Features of the Peugeot



EXHAUST AND INTAKE SIDES OF PEUGEOT MOTOR WITH CAMSHAFTS REMOVED

WITH Dieppe, Le Mans, Mont Ventoux and Boulogne as evidence, the Peugeot racer undoubtedly is the finest pure speed production France ever has possessed. Built under no-limitation regulations, the car is distinctive as a specimen of light-weight high-efficiency type developed of recent years in Europe.

Its four cylinders measure only 4.3 by 7.8 inches, from which it has been possible to get 175 horsepower on bench tests; the maximum speed of the car is about 120 miles an hour; its total weight empty is 2,000 pounds; and although shaft-driven it holds to the road better than the majority of chain-driven racers.

The car is largely the production of Georges Boillot, the Peugeot race driver, and his companions, Goux and Zuccarelli; with their experience in light-car races, they determined the distinctive features of the big car and were responsible for many of the interesting details which go far towards the making or the maring of a speed production. Shaft drive was decided on after lengthy experience with both types of final drive, Peugeot having at first been a partisan of side chains for racing, and later coming over to the shaft for all models.

Light Weight a Factor

The importance of restricted weight and perfect adherence to the road was manifest at the Dieppe grand prix. It undoubtedly was owing to the lower tire consumption consequent on the lower weight that the car with half the cylinder area was able to beat the Fiats in this long-distance event. At maximum speeds the Peugeot appeared to stick to the road better, and was probably easier to handle than Bruce-Brown's Fiat, although it would be impossible to offer much criticism at the Fiats on this particular score. The entire Peugeot power plant is carried on a three-point suspended subframe having the form of an elongated U, the curve

Racing Drivers Credited with Improving the French Car Design

being at the fore end and having a central swinging attachment to a very substantial double transverse frame member. Both this and the two rear ball-and-socket attachments are provided with lubricators, the object of the design being to eliminate the power plant from all the twisting strains of the main frame members. The frame members themselves have not much that is distinctive: they have an upward curve in order to clear the back axle and are narrowed in front; the chassis is carried on very broad, flat springs, Fig. 1, and two stout leather bands encircle the rear axle and the rear transverse frame member in order to eliminate violent action of the springs.

The motor has its cylinders in one casting, is attached to the crank chamber by five bolts a side and has its valves inclined in the head at an angle of 45 degrees. There are four valves per cylinder, their diameter being 2.36 inches and their lift .43 inches. The normal speed of the motor is 2,200 revolutions, which gives a piston speed of 47 feet 10 inches. The valve design is a Peugeot patent, for although the inclined position of the valves is not unusual the method of operating them by means of independent overhead camshafts is altogether original. This position gives a hemispheric combustion chamber and allows the placing of the spark plug—one per cylinder—directly in the head. Each camshaft, with its pushrods and valve springs, is complete in an aluminum housing placed sufficiently high above the head of the cylinder to isolate it from the heat of

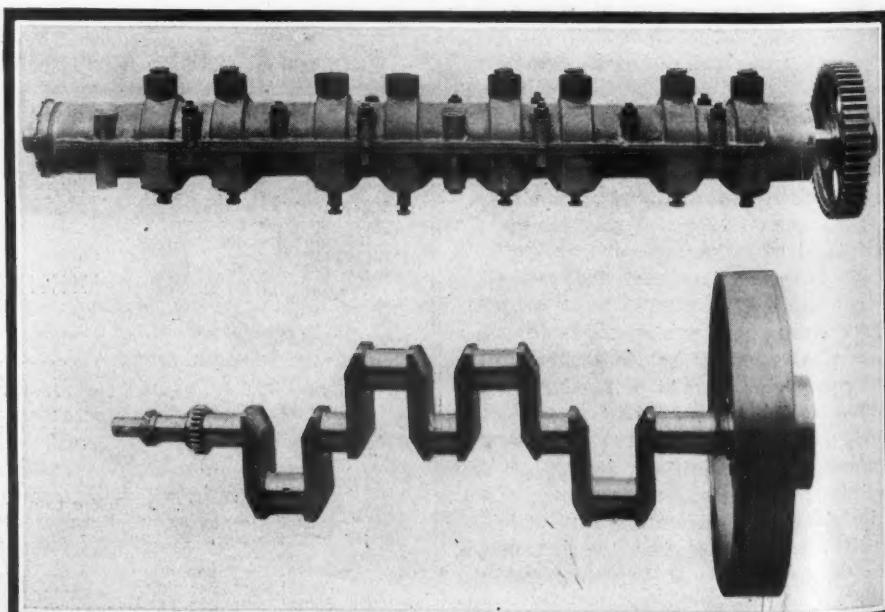


FIG. 1—CAMSHAFT. FIG. 2—CRANKSHAFT USED ON PEUGEOT RACER

this latter, and is carried on a series of seven long projecting bolts. The drive is obtained by a vertical spindle at the fore-end of the motor and inclosed gearing at the upper front end of the engine to the spur pinions on the end of each camshaft.

Profits by Racing Experience

Profiting by racing experience, the design of the valve is such that in case of a breakage it is impossible for the head to drop onto the piston. The camshafts, Fig. 2, complete with their housing and pinion are mounted over the respective range of valve stems and can be lifted away by withdrawing a series of seven nuts. The exact nature of the valve-operating mechanism has not been revealed. Each shaft naturally carries eight cams operating within the interior of an eccentric having a pushrod without roller forming an integral part with the eccentric. The tappets have adjustable heads and are returned by light coil springs on top of the camshaft housing.

The crankshaft, Fig. 3, is carried on five plain bearings, and is of chrome nickel steel and is bored throughout for lubrication under an exceptionally high pressure. Steel pistons are used with hollow connecting rods, the weight of the reciprocating parts being kept as low as possible, the complete piston, with rings and wrist pin weighing only 32 ounces. The wrist pin is fixed in the connecting rod and is carried in bronze sleeves within the piston. The crankchamber, Fig. 4, divided horizontally into two portions and having the crankshaft carried in the lower portion, is provided with two large hand holes on each side for inspection of the connecting rod ends. The space between the top of the crankchamber and the base of the cylinder is filled up with the exception of the space necessary for the passage of the connecting rod, and in this guard plate a series of holes are drilled to allow of the return of the oil swept from the cylinder walls into the base chamber. The lower por-

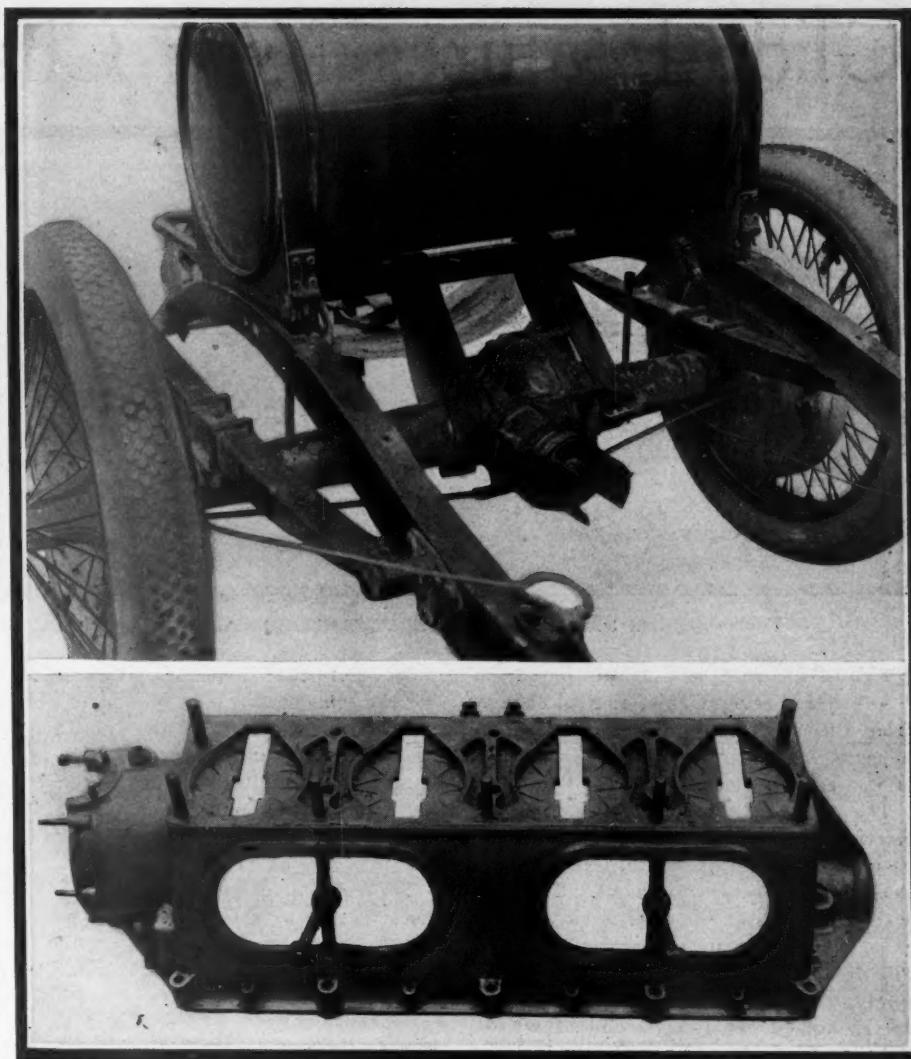


FIG. 3—REAR AXLE SHOWING LEATHER BRACELETS TO TRANSVERSE FRAME MEMBER. FIG. 4—UPPER HALF OF CRANK CHAMBER

tion forming oil tank is deeply ribbed to assist in cooling the oil. A constant level is maintained and if this level should be exceeded a hand pump allows the mechanic to draw the excess out of the motor to the reserve tank.

A gear pump carried within a cylindrical housing and having a cone seat-

ing draws the oil from the base chamber, delivers it to the main bearings through the hollow crankshaft to the connecting rod ends, and up the tubular connecting rods to the wrist pins. All the oil leads are internal and are steel tubes brazed in the crankchamber, special care having

(Continued on Page 38.)

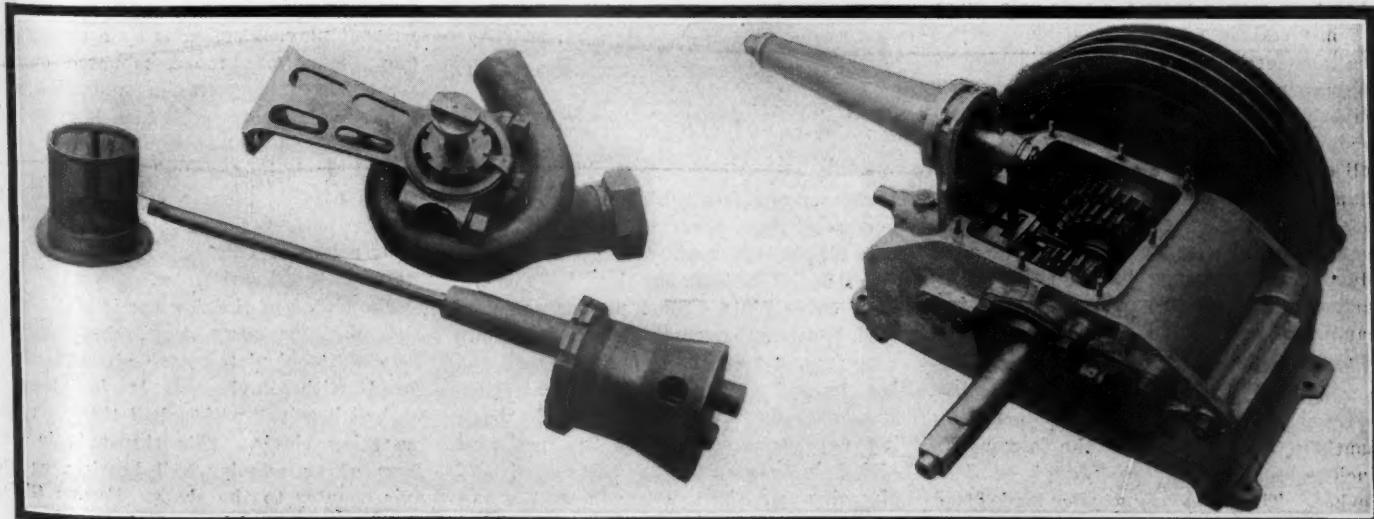
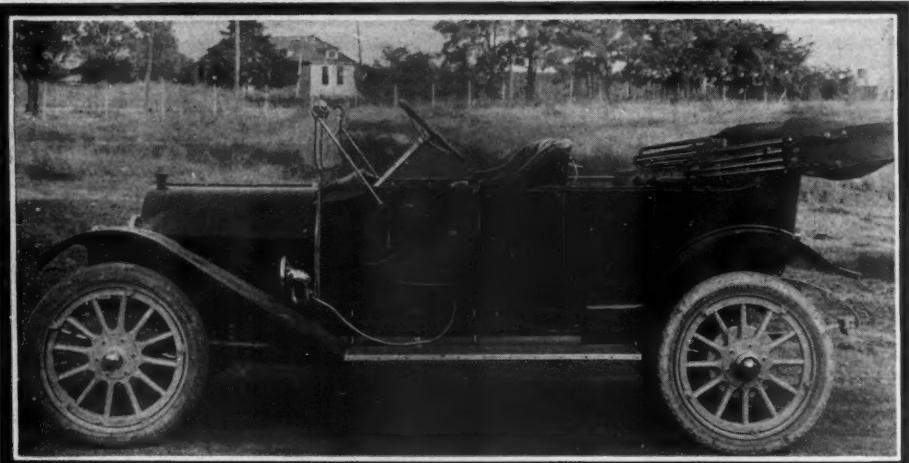


FIG. 5—OIL PUMP FILTER AND WATER PUMP

FIG. 6—PEUGEOT GEARBOX

Glide Features New Chassis for 1913



GLIDE 36-42 FIVE PASSENGER TOURING CAR

REPLACED with new features and embodying several quite radical changes from former practice, the Glide for 1913 appears in the form of a development of last season's model 36.

The most notable changes are in the motor and transmission system. The new patterns of which are quite different from those of last season's models. The general dimensions of the chassis have undergone refinements in proportion and size. The new motor is cast in block instead of singly, as in former Glide practice; the valves are on the left instead of on the right, as formerly and completely inclosed to exclude dirt and water, to keep the engine cleaner than when these parts are exposed, and to decrease the noise produced thereby.

Many Radical Changes

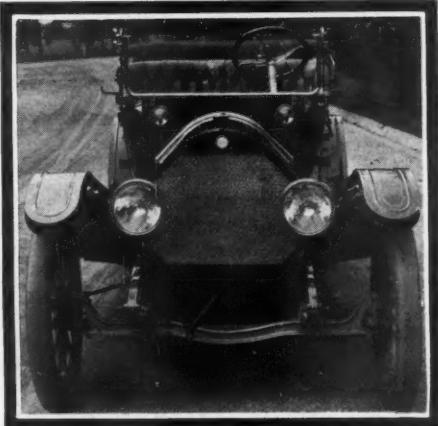
The cylinder sizes have been modified somewhat in favor of a longer stroke, the bore having undergone a slight decrease and the stroke an increase. The rear axle this year is of the floating type instead of semi-floating and the gearset has been moved from the rear axle, where it has resided so long in Glide practice, to the orthodox position amidships, it being incorporated as a unit with the clutch and motor. Tire sizes have been reduced from the former 36 by 4½ sizes all around to 34 by 4 on all wheels. Left-hand drive and center control are features for the coming season with the additional equipment of electric lights supplied by dynamo and storage battery; a starter; an engine-driven tire pump, and full top, lamp, and windshield equipment.

The new car as a whole is better balanced, having a wheelbase of 118 inches, a tread of 56 with option of 60 inches for southern roads; instead of the former 120-inch wheelbase and the tread of 54½ inches. The tires are smaller and fitted on demountable rims. The frame has received a drop which renders the tonneau

more comfortable and lowers the center of weight somewhat.

The Glide motor is of the L-head type, four cylinders and four-cycle, the cylinders, intake manifold and valve-rod housing being cast integral. The cylinders are 4½ by 5½ on the new motor instead of 4½ by 5 as on the present model.

The position of the valves on the new motor is side by side, their entire mechanism being inclosed as shown in the sectional illustration. The valves have nickel-steel heads electrically welded to



FRONT VIEW OF 1913 GLIDE, SHOWING DASH LAMPS AND LEFT-HAND DRIVE AND RIVETLESS MUDGUARDS

carbon steel stems and bearing upon hardened steel tappets, the valve springs, stems and tappets are readily accessible for inspection or adjustment by the removal of a cover plate. Steel pistons are used with H-section connecting rods. These are drop-forged from high carbon steel and heat-treated to withstand crystallization. The wrist-pin is held rigid and the bearing caps are retained by 3½ per cent nickel bolts secured by castellated and pinned nuts. The wrist-pin and crank bearings are of a special alloy of nickel babbitt, fitted with steel shims to permit

Bartholomew Brings Out New Four Embodying Many Interesting Features

of taking up wear. The crankshaft is turned from a solid billet of high-carbon steel and is mounted on three bearings of nickel babbitt supplied with steel liners to permit of adjustment and the take up of wear. The camshaft is of one piece with cams integral, hardened and ground.

The crankcase is of aluminum cast in two halves, the upper portion carrying all bearings, etc. The support arms are integral therewith, in the form of a sub-pan as shown in the end section of the motor and of very interesting design. The lower portion is secured to the upper by bolts and acts merely as an oil pan and may be dropped for inspection or adjustment of the internal parts. This bottom is fitted with oil drains and means for mounting the oil pumps. The flywheel casing which completely incloses this member and the clutch, is bolted integral to the engine base.

Two Oil Pumps

Lubrication is by a constant-level splash system using two pumps situated at opposite ends of the crankcase. This placing insures a constant supply of oil to each pump at any angle of gradient, assuring a positive circulation of oil. They are supplied with separate sight feeds on the dash and feed to the rear main bearing and to the timing gearcase through copper tubes, from whence the oil overflows into the crankcase where, by the splash system, it is used to lubricate the crank pins, wristpins and cylinders.

Designed for Silence

Timing gears are all helically cut to eliminate sound, and made of mild steel, while the idler gear is of cast iron, the difference in the hardness of the metals preventing wear and insuring long life without play. Cooling is by a centrifugal pump made of bronze, mounted on the right side of the motor in connection with a honeycomb radiator; which is cooled by a fan, driven by an adjustable belt.

Ignition is by the dual system, a Remy magneto being used in connection with a storage battery for starting. Carburetion is by means of a Stromberg single-jet non-water-jacketed carburetor.

The clutch of the new car is of the multiple-disk, dry-plate type, consisting of fourteen steel plates, each alternate plate faced with Raybestos. It is mounted on ball bearings with a ball thrust on the operating clevis. This thrust is in the form of an annular ball bearing, on an axis counter to the shaft. Former Glide clutches were without facing and operated in a bath of oil.

Design Differs from Former Practice

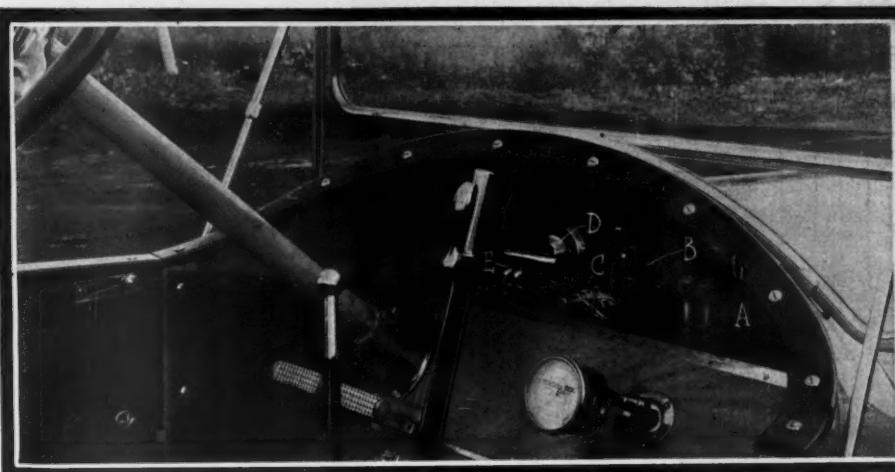
Old Custom Abandoned by Peoria Maker, Who Features Full Equipment

The gearset of the Glide in its new position amidships is of the three-speed selective type, bolted to a flange on the rear of the flywheel housing. It runs on Timken roller bearings. The gears are cut from chrome nickel steel, are of large diameter and run on nickel steel squared shafts. An automatic lock is used in the control to prevent the engagement of more than one speed at a time. A large hand hole is provided in the top of the casing for the filling of the gearset case with grease and for minor clutch adjustments. Access to the gearset is to be had through a removable cover. Drive is to the rear axle by a shaft with but one universal joint.

Floating Axle New to Glide

The new axle is of the floating type of pressed steel. The axle shafts have the drive flange forged integral and carry no load other than the driving torque. The housing is substantially a single piece of pressed steel of $\frac{1}{8}$ -inch gauge. The wheel carriers are of nickel steel tubing accurately ground to accommodate the wheel bearings and are expanded integrally to the housing proper. The differential is of the bevel-gear type, its bearings and the wheel bearings being of the annular-ball type. The brakes are mounted with the axle assembly with their operating shafts extending inside of the frame and forward of the axle out of sight and lending a clean appearance to the axle. The brakes are of the double-expanding type, completely inclosed and are 14 inches in diameter, being situated side by side and faced with non-burn lining. Propulsion is through a torsion tube inclosing the drive shaft.

The front axle is of I-beam section, forged in one piece from 35 per cent carbon steel, with exceptionally long spring seats. The wheel bearings are of the cup and cone type of standard dimensions, fitted with imported Hoffman balls. The outer bearings carry $\frac{5}{8}$ -inch balls, the inner balls being $\frac{3}{4}$ inch in diameter. Steering connections are drop forged of high carbon steel and heat treated. The drag link is situated at the rear of the axle, where it is protected by the axle from injury. The axle is dropped between the spring seats which are of unusual length. This construction permits of rigid clamping of the springs to the axle. The front springs are half-elliptic, 36 inches long, and the rear springs are of the three-fourths scroll elliptic type, 46 inches in length. All spring shackle bolt eyes are supplied with reamed phosphor bronze bushings, the shackle pins being of hard-



DASH ARRANGEMENTS OF NEW GLIDE CAR, SHOWING CONTROLS

ened and ground steel with integral grease cups. The frame is of cold-drawn pressed steel of channel section, $\frac{3}{4}$ inches deep, with a 2-inch drop under the rear door.

Steering is by irreversible worm-and-nut steering gear of the differentially-threaded double nut type. It is operated by a 13-inch walnut wheel from the left-hand side. The control is by means of spark and throttle levers on top of the steering wheel, a foot accelerator between the clutch and brake pedals, and the gearshift and emergency brake levers in the

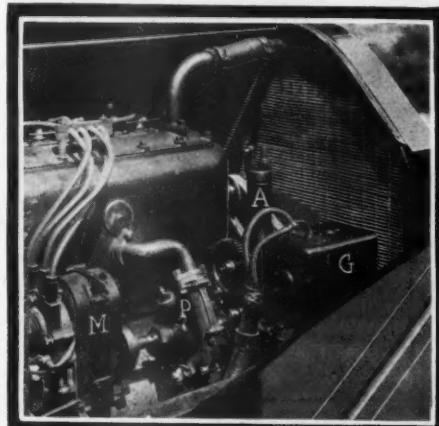
head lights and standing lights respectively. The electric system is of Ward-Leonard manufacture and consists of a generator mounted on the right side of the motor and gear-driven from the engine which supplies current to an 80-ampere-hour storage battery situated on the right running board, through a cutout which automatically prevents overcharge and leakage of current from the battery back through the generator armature. This current is used for both lighting and as auxiliary to the magneto in ignition. This generator will produce sufficient current to light the car independent of the battery at normal running speeds.

Tires are of 34 by 4-inch size on Baker demountable rims, as regular equipment. The rest of the equipment includes a power tire pump driven by a pair of sliding gears from the engine, a starter of the acetylene type, supplied from a Prest-O-Lite tank, a mohair top with boot and side curtains, a windshield, five electric lamps, a Stewart speedometer with grade indicator, a spare rim, tire carrier, and full tool equipment.

Two Body Types

This chassis is fitted with two types of bodies, a fore-door touring car, all four doors of which are practicable, and a two-passenger speedster with two doors. The position of the center levers on both models is sufficiently forward to permit the driver to pass behind them and leave by the right-hand door. The floor of the front compartment of the touring car and of the speedster is carpeted with cork linoleum bound with aluminum and the tonneau of the touring car is floored with carpet, bound with leather.

The interior walls of the bodies are covered with leather and the doors are fitted with pockets. The bodies are protected from splash and mud by completely inclosed running boards of sheet steel.

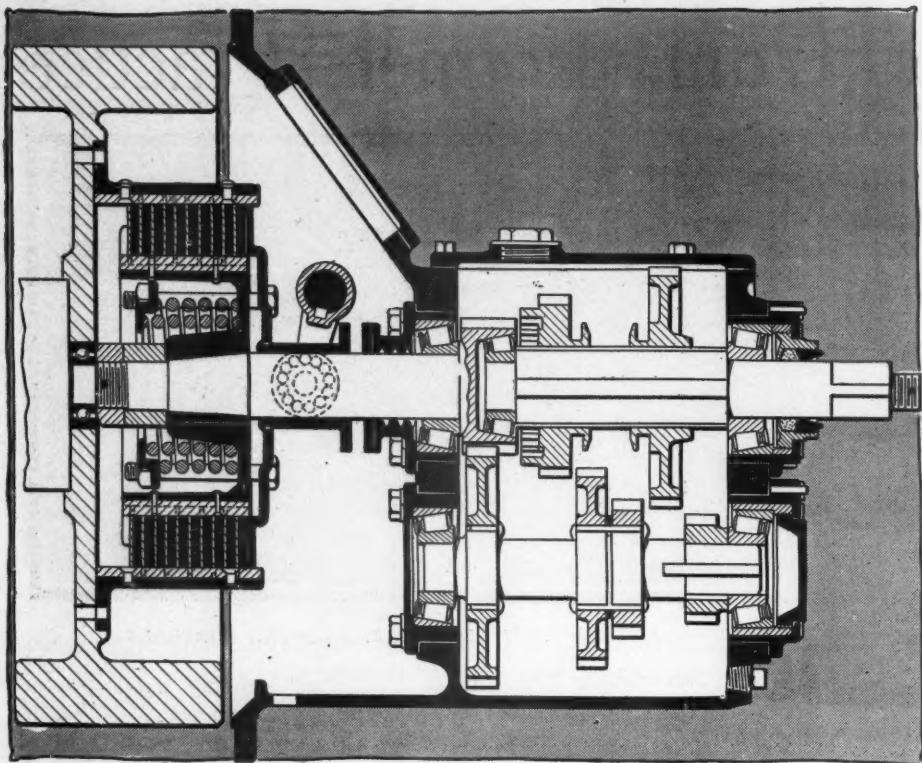


GLIDE MOTOR, SHOWING GENERATOR, G; MAGNETO, M; WATER PUMP, P; AND AIR PUMP, A

center. The cutout is operated by the right heel.

Neat Dash Arrangement

The dash arrangements, as shown in the accompanying illustration, are arranged for convenience. The position of the speedometer makes it readily legible and permits the shaft to be laid without sharp bends. At A are the oil sight feeds, at B the dual kick switch, at C the valve and connection for the power tire pump, D is the handle of the Prest-O Starter, and at E, the button that controls the



MULTIPLE-DISK CLUTCH AND GEARSET UNIT, SHOWING NEW BALL BEARING THRUST OF CLUTCH CLEVIS.

No rivets appear on these members, all supports and connections being electrically welded thereto. All metal parts are finished in nickel or black enamel, the dash, dashrail and capping are of black walnut secured with nickel screws and cap washers. Fifteen gallons of gasoline are carried in a low position, by gravity.

Fifteen gallons of gasoline are carried in the tank beneath the seat of the touring car and 25 gallons in the cylindrical tank on the rear deck of the speedster. Both feed to the carburetor, which is in a low position, by gravity.

Features of Peugeot

(Continued from page 35.)

been necessary to prevent leakage owing to the unusually high oil pressure maintained. The camshafts are fed by a hand pump, with an overflow to the basechamber. A downward extension of the vertical spindle driving the timing gears, operates the oil pump, the Bosch high-tension magneto and the water pump, Fig. 5, are driven from the respective extremities of a transverse shaft. During all its races the car was fitted with a new type of Claudel carburetor.

A multiple-disk clutch takes the drive from the motor to the four-speed gearbox, this latter, as already explained, being mounted on the subframe. The gearbox is a compact structure with the two shafts carried in a horizontal plane and having the selector within the box, instead of being on the outside of the frame members as is usual. As can be seen from the illustration, Fig. 6, it is

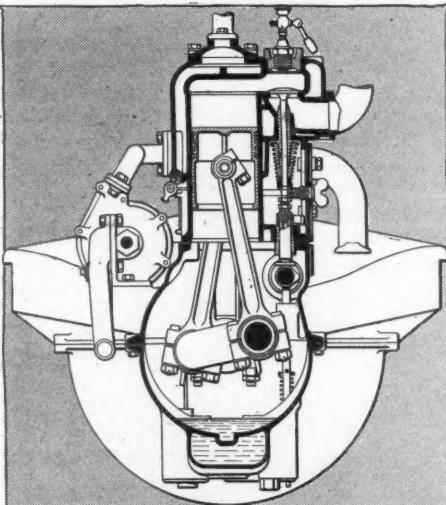
completely protected from dust, there being nothing external but the change speed lever. The arrangement of the three sliding sets of gears is not that usually adopted: the first one gives the first and reverse speeds; the second and third, and the fourth direct drive by means of a dog clutch. At a motor speed of 2,200 revolutions a minute, the ratios give a car speed of 55, 74, 99, and 112 miles an hour. Both primary and secondary shafts are bored out to reduce weight.

Rear Axle Construction

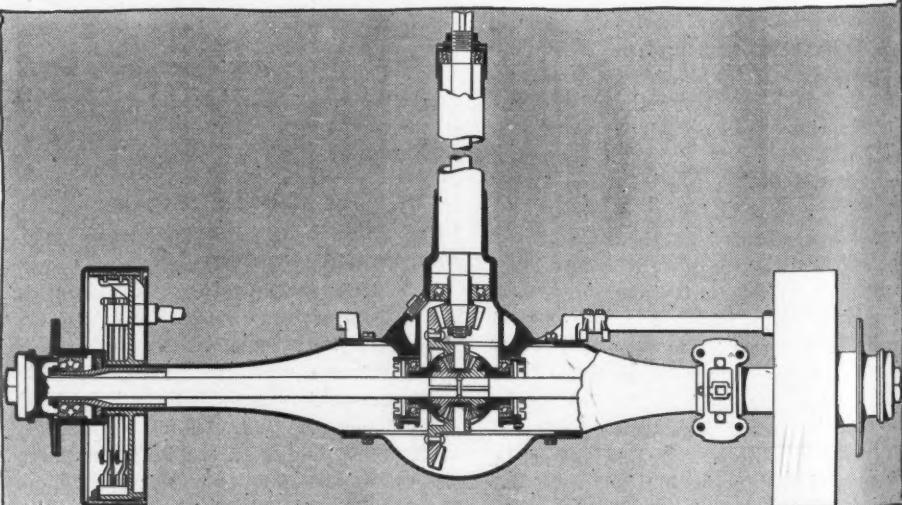
The propeller shaft has a universal joint at each extremity, these joints being carried on ball bearings. A floating rear axle is employed with a vertically-divided differential housing of aluminum. This rear axle is a remarkably light construction, and in order to reduce weight even the cover of the bevel pinion housing and the jaws of the universal have been drilled. Very large diameter ribbed brake drums are fitted, the operation of the rear wheel brakes being by hand lever with steel cable connection.

There are neither radius nor torsion rods, all the effort being transmitted through the rear springs. The foot brake, also of the ribbed type, encircles a broad faced big diameter drum at the rear of the gear box. The two shoes are united by a vertical screw having rapid right and left hand threads cut on it, it thus being merely necessary to turn this screw in either one direction or the other in order to separate or bring together the two shoes. Provision is made for very rapid regulating of the brakes; the hand brakes can be regulated through a trap in the foot boards while the car is in motion.

No attempt whatever has been made to incorporate a stream line contour in the body. The bonnet is narrowed in somewhat at the front, thus reducing the width of the plane surface radiator, but there is no other attempt at wind cutting. The gasoline tank is carried transversely across the frame behind the driver's seat and the two spare wire wheels are to the rear of the tank.



END SECTION OF GLIDE MOTOR



FLOATING REAR AXLE OF NEW GLIDE CAR FOR 1913 SEASON



The Motor Car Repair Shop

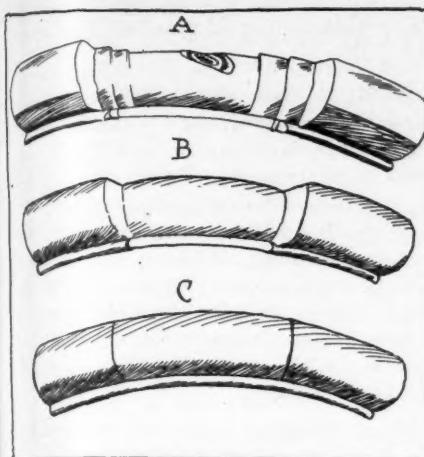


FIG. 1—STEPS IN SECTIONAL REPAIR OF CASING

THOUGH extensive repairs of tires should not be attempted in the shop without a complete line of equipment, a knowledge of the processes and methods used for repairing different classes of injuries in tires is of benefit, even though they are not undertaken. Such knowledge will assist the repair man in advising clients as to what can be done with a damaged tire and what the approximate cost will be. The B. F. Goodrich Co. recently has issued a manual of tire repairing which, while applying in particular to Goodrich tires, the instructions can be followed in examining and repairing any standard make of tire.

Repairs to casings may be divided into three classes: Inside repairs, sectional repairs and retreading. An inside repair may be made in a casing in which there is a cut through the tread of not more than 2 inches in length or a fabric break not involving all the plies of the fabric. In making a repair on an injury of this kind slip out two plies of fabric for a space of 5 inches on each side of the injury, removing the first ply halfway around the bead. To do this, the bead or protector strip should first be loosened back to the heel of the bead. On the outside around the injury, bevel the thread to a feather edge and then buff thoroughly on a wire buffing wheel. The tire at this stage has the appearance shown at A and C, Fig. 2. The parts to be repaired are then washed with benzine and two coats of cement applied, covering a space of 2 inches larger than the size of the fabric cut out. At least 1 hour should be allowed for each coat of cement to dry. Then two plies of fabric are inserted and fitted accurately to the space cut out and over this a patch E is applied composed of two plies, stepped, of same kind of fabric. This patch should be 2 inches longer than the fabric stepped out and should not extend closer than $\frac{1}{4}$ inch to the toe of the

Repairs of the Tires

Part I

bead as far towards the heel as the cutting down extends. The bead strip is then rolled down into its position. The inside of the casing is now ready for curing and has the appearance shown at B.

Around the edges of the injury outside, a strip of gum $\frac{1}{64}$ inch thick is applied and then filled up even with tread gum. The outside of the casing ready for the cure is illustrated at D. The cure takes 35 to 40 minutes at 50 pound steam pressure in a cavity vulcanizer and then on an inside vulcanizer for 25 to 35 minutes at the same pressure.

Any injuries to the fabric over 2 inches long involving all the fabric piles, should be repaired by inserting a sectional repair or reinforcement. To prepare the case for this treatment remove the cover and tread—including breaker strip and bead strip—not less than 4 inches beyond each end of the injury. All the gum having been removed, measure in 1 inch from each end of the exposed fabric, and with a fabric knife cut the first ply only, following it down over the bead on each side. Entirely remove this ply from the beads and case, using a fabric hook for this purpose. One inch from where the first ply of fabric is cut out cut the second ply, taking this off to the center of the bead, unless the injury is at or close to the bead, in which case remove it to the toe or tip of the bead. If the removal of a third ply is advisable step it out in the same way, but this will be necessary only in the case of $4\frac{1}{2}$ -inch cross-section or larger, and to the bead only.

Around the edge of the hole or cavity, skive the fabric to a bevel or feather edge in order to prevent the new and old fabric from separating after the repair has been made. Skive or bevel both edges of the old gum and buff on a wire buffing wheel until the edges are well ruffed up. If any of the old friction adheres to the fabric, buff the fabric lightly to remove it. The casing with its cut down section ready to cement is shown at A, Fig. 1. Clean thoroughly inside and out with benzine or gasoline. Clean the inside for a space of about 2 inches more than the outside has been cut down. Apply two coats of cement both inside and outside, allowing an hour to intervene after each coat. Inside the case insert a patch of two plies, stepped, of fabric. This patch should be 2 inches longer than the outside repair, and should extend only within $\frac{1}{4}$ inch of the toe of the beads. Place casing on tire form, fill in the injury with cushion gum and put a narrow strip $\frac{1}{64}$ inch thick of the same gum over each exposed edge of fabric where it has been stepped out, and over the exposed beveled edges of old gum. Replace each ply of fabric that has been removed with fabric. The last ply should overlap each and $\frac{3}{4}$ of an inch on the tread and taper down to no overlap on the sides. Run the fabric down on the beads only so far as you have taken out the original fabric. Replace the bead strip with fabric. Use fabric from 3 to $3\frac{1}{2}$ inches wide for the breaker strip. Apply unvulcanized gum on the sides $3\frac{1}{32}$ inch thick. The casing with fabric applied is illustrated at B. Then fill up with either dark or light gum, depending upon what shade of tread is to be matched.

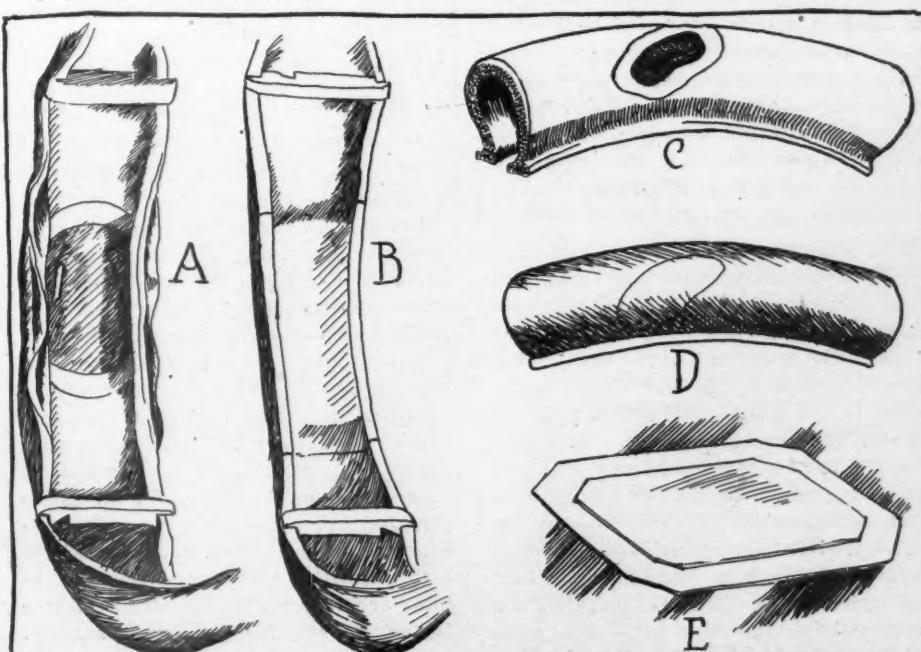


FIG. 2—FOUR STEPS IN MAKING AN INSIDE REPAIR OF A CASING

WHEEL TAX at Danville—Danville, Ill., placed a new wheel tax in effect October 1, and, as it affects motor cars, many owners are protesting.

Fargo Has Building Bee—The Fargo Automobile Club of Fargo, N. D., is seeking a site for a club house which it proposes to erect early in the spring. The plan is to build a club house on the banks of the Red River of the North a few miles from the city. Golf links and tennis courts will be provided and the club will be conducted as a town and country club.

Indianapolis Registrations—Approximately \$25,000 have been collected by the city of Indianapolis so far this year for motor vehicle licenses. Until this year the annual fee was \$3 and the amount raised last year was \$7,800. Thus far this year licensees issued have been as follows: Runabouts, 1,262, at \$5 each; touring cars, 1,748, at \$8 each; light trucks, 158, at \$10 each; and heavy trucks, 184, at \$15 each. The total number of cars licensed this year has been 3,352, as compared with 2,600 last year.

Texans After a Club House—A committee has been appointed at Dallas, Tex., to make plans for the erection of a \$30,000 club house to be known as the Sister City's club house. The erection of the building will be under the direction of the Dallas and Ft. Worth motoring associations. Plans are to erect the building at a point midway on the Dallas-Ft. Worth pike, and also easily accessible by the interurban. An option has been secured on several acres of land. In addition a garage will be erected.

New Idea in Garages—The Bridge Street hotel, one of the landmarks of Grand Rapids, Mich., is being razed and will be replaced by a garage and motor car and supply establishment with hotel accommodations as a side issue. The building will be 100 by 100 feet, three stories in height, and will be known as the Modern garage. It is to be located at Michigan street and Bond avenue. Hotel accommodations, except meals, will be provided for tourists in the new building and separate apartments for motor cars, to which owners of the cars may carry the keys, will be provided. The new building is expected to cost \$50,000.

Ohio Farmers Buying Cars—According to the statistics furnished by the state registrar of motor cars of Ohio, the rural sections of Ohio are buying cars as never before. The wheat and oats crop is being rapidly converted into motor cars, as is shown in the number of applications for registration coming from the rural counties. Of the licenses issued now about 80 per cent come from the strictly agricultural communities. In the counties of Madison, Miami, Pickaway, Ross, Fayette, Licking, Montgomery, Fairfield and other rich agricultural counties the elevators are fairly bulging out with grain and automobiles find a ready sale. For the first

half of September the number of new cars registered was over fifty per day. The rule in farming sections now is early selling of grain and this aids the motor trade.

Herding with a Motor Car—The latest use of the motor car in Texas is in herding cattle on the western plains. During the past week the idea of herding cattle in a car was tried out on a ranch in Potter county.

Rock Island Motorists Organize—The Rock Island Automobile Club was organized at a meeting in Rock Island, Ill., the following officers being elected: President, Joseph DeSilva; secretary, Charles E. Hodgson; treasurer, George W. Reddig. The object of the club is to secure the improvement of the country roads and promote the welfare of the members. The club will affiliate with the state organization and do everything in its power to secure state highways.

Completing Brick Road—Rapid progress is being made on the new brick road between Niagara Falls and Buffalo, N. Y., and the entire boulevard will be completed by October 1. The boulevard is being built of brick for a width of 16 feet for motor vehicle traffic, while 16 feet of dirt road is left open for horse-drawn and other slow vehicles. This method was followed in the construction of the road so that the 16 feet of dirt road may be extended in width to 32 feet in future if necessary.

Hoosier Club Contributes—An appropriation of \$2,000 has been made by the Hoosier Motor Club of Indianapolis for the fund being raised to buy the material for building a rock road from New York to San Francisco. The club has endorsed the plan, as has the Indianapolis Commercial Club. The club, on September 28 and 29, will give a sociability run to the farm of George Ade, at Brook, and to Kentland. A reception will be given by the Commercial Club of Kentland to the club on the evening of September 28. Those making the trip will spend the night at Kentland.

Motoring in Venezuela—An extensive concession providing for a motor passenger and freight service covering a considerable territory in the vicinity of La Guaira, Venezuela, has been granted, subject to the approval of the national congress. The concessionaire will construct the roads necessary to the maintenance of his schedule. The government will protect the enterprise from competition for a period of 30 years, but all tariffs must first be approved by the authorities before being made effective. One of the chief difficulties that has surrounded the motor car industry in La Guaira is the difficulty of securing gasoline. Passenger vessels refuse to carry it and the supply

comes from sailing vessels only, whose calls are irregular and far from frequent. The standard price of gasoline is 65 cents per gallon.

Michigan Picks Road Officials—At the annual meeting of the Michigan State Good Roads Association, the following officers were re-elected: President, Philip T. Colgrove, Hastings; vice-president, N. P. Hull, Dimondale; secretary, A. A. Anderson, Hastings; treasurer, J. Edward Roe, Lansing. Following are the trustees chosen: Roy D. Chapin, Detroit; Alvah Brown, Grand Rapids; W. K. Prudden, Lansing; Maj. Arthur Loomis, Ionia; W. W. Todd, Jackson.

Object to Street Car Law—The Columbus Automobile Club, Columbus, will make every effort to secure the repeal of the recent ordinance that provides that a motor car while passing a street car, discharging passengers, must come to a full stop. The ordinance went into effect September 15, but up to the latter part of the week there were no arrests by the police for the violation of the same. The ordinance provides for fine from \$5 to \$25 for the first violation and 30 days' imprisonment for subsequent violations.

Dominion Wants Federal Aid—Winnipeg will have the third annual convention of the Canadian Highway Association, which is scheduled to meet on October 9 and to continue its session until October 12. One of the important subjects to come up for consideration will be the granting of federal aid for road building in the different provinces. Last year \$1,000,000 was set aside for this work, but the bill failed to meet with the approval of the elected representatives of the people, not because the measure was not approved of, but on account of technical objections which were raised in the upper house. It is the intention to reintroduce this measure at the next session.

Minnesota Reports—Every county in Minnesota, except Cook, is shown by figures of the state tax commission to have motor cars. In the state the tax list shows 21,218 machines, estimated in value at \$6,460,220. The commission is engaged in equalizing taxes on property in the state. Including motor cycles the commission finds that St. Paul has 2,070 motor vehicles, worth \$972,335, at an average of \$469.73 each. Ramsey county has 2,122 cars, valued at \$989,621. St. Paul is the county-seat. A year ago St. Paul had 1,416 cars, worth \$831,115. In the same list Minneapolis is rated at 5,023 cars, valued at \$2,296,470, at an average of \$475.19. Hennepin county, of which Minneapolis is the seat, has 5,316 cars, worth \$2,415,465. For Minneapolis the 1911 figures were 3,046 cars, worth \$1,721,665.

From the

Four Winds

In Duluth there were reported for taxation 532 cars, valued at \$287,093, at an average value of \$558.45. Last year the city reported 426 cars, totaling \$241,069.

Cars Barred from Island—As a result of Captain F. C. Pendleton of Brooklyn, N. Y., driving his motor car through the roads of Isleboro, Me., that had been held sacred against motor traffic through an unwritten law, the residents of that town called a special town meeting and by a vote of 58 to 7 directed the selectmen to take steps to exclude motor cars from the island kingdom.

Texas Motorists Co-operating—The Automobile Owners' Protective Association is the latest addition in the way of organizations in Dallas, Tex. The members of the association have organized with a capital stock of \$25,000 and have leased premises for a garage. O. H. Bettes has been made manager. The garage is for the use of members of the association. Legal advice is also offered to the members of the association.

Demand a Stone Road—As a direct result of the sociability tour which was made from Nashville to Huntsville, Ala., recently, the Tennessee-Alabama Good Roads Association has been formed. The association will work for the general improvement of roads, but the principal efforts are to be confined to the improvement of the trunk line highway between Nashville and Huntsville. The members of the new association do not expect to be satisfied until the two cities are connected with a stone roadway.

Reciprocity Law Pinches—The Springfield, Mass., Motor Club has decided to get busy when the next legislature meets to try to have a change made in the motor law whereby there will be a better plan for reciprocity touring in the New England states. Visitors from Vermont, Connecticut and Maine are limited to 10 days in the Bay State, but Massachusetts motorists are not restricted in those states. There has been a lot of friction this year over the reciprocity clauses and a change will probably be made next year in some of the states.

Call Out for Road Meeting—Under the auspices of the Commercial Club and with the co-operation of the Indiana Good Roads Association, a good roads convention will be held in Indianapolis during the first week in December. Invitations are now being sent to all persons in Indiana interested in road building asking them to attend. There will be an exhibit of good roads machinery in Cincinnati the week before the Indianapolis convention and an effort will be made to have the exhibit in Indianapolis for the meeting. It is thought the meeting will result

in a number of bills for good roads legislation being prepared for introduction in the Indiana legislature, which convenes in January.

Car Tows Canal Boat—The experiment of towing canal boats by motor car was made at Pendleton, N. Y., by William Gleasner, superintendent of the Great Lakes Co., barge-canal contractor. With a 30-horsepower car he towed a canal boat loaded with lumber for a distance of 3 miles at the rate of 6 miles an hour.

Will Not Increase Tax—After considering the matter several days the county council of Marion county, Ind., in which Indianapolis is located, has refused to increase the county road tax levy from 3.15 cents to 6.3 cents on each \$100 of taxable property. About 300 Indianapolis business men urged the council to double the road tax levy, believing that proper and efficient road building would result.

Motors Too Numerous—Because motor cars pass her property too frequently, and in one Sunday recently 4,700 cars swept along past the door, Miss Kate Cary of New York, one of the heirs of Mrs. Hartman Kuhn of Boston, is to move Butternut cottage in Lenox, built in 1770, to a new location further back from the highway. The noise and dust are too much for comfort and convenience.

Beavers Flood Highway—Motorists who have been touring in the Dead River region in Somerset county, Maine, report trouble on the Horseback road in Highland plantation due to a colony of beavers. The little animals have built a dam in the culvert near the road diverting the water to the highway and flooding it for a foot or more. The county commissioners have had bother there every summer for some years, due to the beavers, and it has cost thousands of dollars to repair the highway. It does no good to remove the dam, for the beavers rebuild it again in a night. Old trappers state that so long as two beavers remain there the dam will be built repeatedly, for they never abandon a dam, once it has been built.

District's Registrations—The annual report of H. M. Woodward, permit clerk, reveals the fact that permits to operate motor cars in the District of Columbia were issued to 2,343 out of 2,393 applicants who were examined by the motor car board during the fiscal year that ended June 30 last. Of the permits granted 200 were for the operation of electric vehicles, 1,790 for gasoline machines, 22 for steam cars, and 331 for motor cycles. The revenue derived amounted to \$6,022. There were registered and paid for during the year 3,924 metal identification tags, which produced a revenue of \$7,848. Two permits were revoked during the year be-

cause of charges filed and upon recommendation of Major Sylvester, superintendent of police.

Vermont Club's Annual Meeting—The Automobile Club of Vermont held its annual meeting at Montpelier last week. The membership of the club is now 1,275. The election of officers resulted as follows: James M. Boutwell, Montpelier, president; E. A. Brodie, Burlington, vice-president; G. T. Chaffee, Rutland, second vice-president; S. S. Ballard, Montpelier, secretary-treasurer.

New Color for Alabama—Flaming red is to distinguish Alabama license tags during the coming year. The license year expires September 30, and in order to avoid a rush at the last minute the state has offered the tags for sale, with the result that many already are in evidence. Cars up to 9 horsepower pay \$7.50; up to 29 horsepower \$12.50; up to 34 horsepower \$17.50; up to and above 40 horsepower \$20. Cars for hire pay an additional tax of \$25.

Yakima After Paved Roads—Yakima county, Washington, will vote on a million-dollar bond issue at the time of the general election, November 5, for the construction of paved roads outside the incorporated towns. Instead of building trunk-line roads the length of the county the commissioners will divide it into districts with an industrial or shipping point as center of each, from which the paved highways will radiate to the fruit and hay-raising districts.

Would Improve Milwaukee Law—Proposed ordinances to repeal or so materially alter the present universal light law of the city of Milwaukee, Wis., as to make it useless, have failed, due to a hard fight by the Milwaukee Automobile Club, which proposed the law in the first instance. Since August 24 all vehicles within the limits of Milwaukee must carry a light visible from front and rear during the period from 1 hour after sunset until 1 hour before sunrise, and a month's trial of the law has convinced more firmly than ever the city fathers that the ordinance is an excellent preventive of possible accidents.

Pittsburgh's Dream Comes True—Within the next 2 weeks the new boulevard leading to the Hill Top boroughs from the south side in Pittsburgh, that has been the dream of the business men and residents of that section for years, will be declared officially completed. Where formerly there was nothing but a rough thoroughfare gouged out along the hillside and winding about with treacherous curves, there will now be a well-paved street, with graceful curves and strong retaining walls. The improved section is nearly a mile long. The grade averages about 7 per cent. This is about the same grade as the old road, but the advantage has been gained by the fact that the bad angles on the road have been eliminated by the reconstruction.

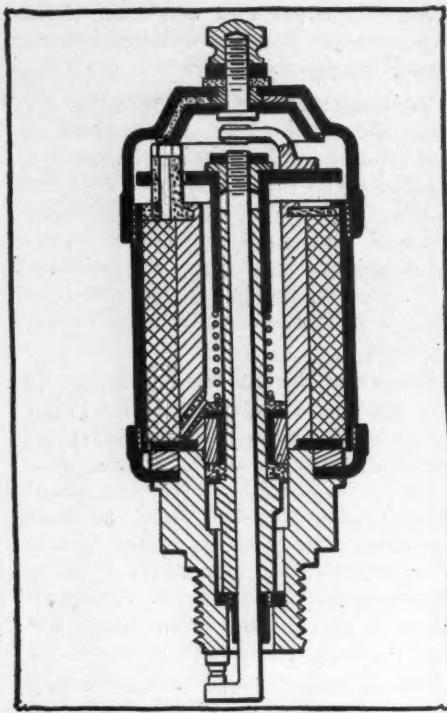


FIG. 1—WITTER LOW-TENSION PLUG

PATENTS ISSUED SEPTEMBER 17, 1912.
1,038,519—Steam Vulcanizer. Ansel M. Baugh, Omaha, Nebr. Filed March 22, 1911. Serial No. 628,711.

1,038,520—Valve Remover. Harry J. Beck, Indiana, Pa. Filed April 21, 1911. Serial No. 622,640.

1,038,522—Vehicle Wheel. George R. Bennett, Denver, Colo. Filed January 18, 1910. Serial No. 538,767.

1,038,533—Valve and Valve Gear. Walker L. Crouch, Cleveland, O. Filed November 17, 1910. Serial No. 592,770.

1,038,535—Spring Wheel. Charles J. Dean, Blasdell, N. Y. Filed November 17, 1911. Serial No. 660,757.

1,038,537—Gas Engine. Albert J. Dexter, Indian Orchard, Mass. Filed June 14, 1911. Serial No. 633,058.

1,038,541—Explosive Engine. Orlando Duckier, Washington, D. C. Filed September 24, 1910. Serial No. 583,626.

1,038,553—Transmission Gear Mechanism. Clayton E. Frederickson, San Francisco, Cal., assignor of one-half to William H. Stenger, Berkeley, Cal. Filed November 7, 1911. Serial No. 658,960.

1,038,569—Attachment for Motor Car Wheels. Fred V. Grover, Park Rapids, Minn. Filed January 2, 1912. Serial No. 668,870.

1,038,576—Spring Vehicle Wheel. Christian F. Heines, Cincinnati, O. Filed August 10, 1911. Serial No. 643,274.

1,038,592—Magneto. Carl E. Johnson, Los Angeles, Cal., assignor of one-half to Charles E. Payne, Los Angeles, Cal. Filed August 30, 1909. Serial No. 515,329.

1,038,598—Valve Mechanism for Motor Car Engines. Orlando E. Kellum, Los Angeles, Cal. Filed July 20, 1911. Serial No. 641,265.

1,038,612—Engine. George A. Lowry, Pawtucket, R. I. Filed May 7, 1910. Serial No. 559,970.

Current Motor Car Patents

1,038,615—Electric Vehicle. Roderick Macrae, Chicago. Filed February 13, 1911. Serial No. 608,333.

1,038,628—Strap-Clutch. James L. Morrow, Antioch, Tenn. Filed December 27, 1911. Serial No. 668,113.

1,038,636—Expansible Chamber. Henry E. Oxnard, Newton, Mass. Filed May 18, 1910. Serial No. 562,011.

1,038,661—Vehicle Wheel. Charles A. Russell, Providence, R. I. Filed September 27, 1910. Serial No. 584,066.

1,038,685—Exhaust for Gas Engines. Albert T. Titus and Albert R. Titus, Robbinsdale, Minn. Filed April 25, 1911. Serial No. 623,220.

1,038,687—Pneumatic Wheel. George H. Treadgold, Port Huron, Mich. Filed October 20, 1911. Serial No. 655,679.

1,038,689—Variable-Speed Power Transmission mechanism. Willard Irving Twombly, New York, assignor by mesne assignments to Twombly Motors Co., New York. Filed April 12, 1910. Serial No. 554,977.

1,038,699—Carburetor. John Wilkinson, Syracuse, N. Y., assignor to H. H. Franklin Mfg. Co., Syracuse, N. Y. Filed August 18, 1902. Serial No. 120,058.

1,038,701—Spark plug. William Siebert Witter, Julesburg, Colo. Filed February 21, 1911. Serial No. 609,961.

1,036,706—Universal Joint and Four-Wheel Drive. John L. Yeoman, Chehalis, Wash. Filed December 5, 1911. Serial No. 664,018.

1,038,737—Anti-Skidding Device. Ernst Finking, Leipzig, Germany. Filed May 20, 1910. Serial No. 562,384.

1,038,739—Dirigible Headlight. Joseph Patrick Fox, Chemnitz, Germany, assignor of one-half to Otto Reinmann, Chemnitz, Germany. Filed June 16, 1911. Serial No. 633,581.

1,038,764—Spring Wheel. Joel D. Knight, Lombardy, Miss. Filed February 29, 1912. Serial No. 680,714.

1,038,767—Internal-Combustion Engine. Arthur M. Laycock, Detroit, Mich. Filed November 27, 1911. Serial No. 662,552.

1,038,780—Engine. John W. Moore and William A. Browne, Columbus, O. Filed September 14, 1910. Serial No. 581,936.

1,038,804—Carburetor. Joseph D. Warren, Providence, R. I. Filed May 9, 1910. Serial No. 560,109.

1,038,808—Shock Absorber. Frederick W. Weyman, Hartford, Conn. Filed January 8, 1912. Serial No. 669,992.

1,038,830—Internal Combustion Engine. Louis Henri Libert Bellem and Gaston Jean-Baptiste Brégeras, Neuilly-sur-Seine, France. Filed August 17, 1909. Serial No. 513,261.

1,038,833—Power-Transmitting Mechanism. Joseph E. Bissell, Pittsburgh, Pa. Filed June 28, 1909. Serial No. 504,781.

1,038,835—Traction Wheel. Samuel M. Bower, Chicago. Filed September 6, 1910. Serial No. 580,744.

1,038,878—Gas Engine Valve. William E. Hallett, Bucyrus, O. Filed October 16, 1909. Serial No. 523,057.

1,038,889—Oil-Feeding Device. Charles F. Hooper, Spokane, Wash. Filed July 22, 1911. Serial No. 639,910.

1,038,903—Resilient Metal Wheel Rim. Carl La Cour, Hubbard, Ia. Filed November 29, 1910. Serial No. 595,164.

1,038,918—Power-Transmission Device. George W. Marble, Chicago, assignor to Stephenson Motor Truck Co., Milwaukee, Wis. Filed January 20, 1910. Serial No. 540,796.

1,038,921—Carburetor. William Edward

Martin, Stamford, Conn. Filed December 27, 1911. Serial No. 668,191.

1,038,931—Muffler. Joseph M. Michaelson, Minneapolis, Minn. Filed June 5, 1911. Serial No. 631,236.

1,038,941—Gas Valve. Frederic G. Nicolaus, Cleveland, O., assignor to American Stove Co., St. Louis, Mo. Filed July 11, 1911. Serial No. 637,933.

1,039,010—Devulcanizing Apparatus. James Bardsley, Akron, O. Filed December 31, 1910. Serial No. 600,227.

1,039,014—Spring Hub for Vehicle Wheels. Herbert Berton Bigsby and William Milo Lewis, New Hartford, Ia. Filed January 11, 1912. Serial No. 670,639.

1,039,035—Bucking Motor Car. Edward W. Desenfans, Chicago, assignor of one-half to Charles E. Desenfans, Chicago. Filed December 9, 1909. Serial No. 532,184.

1,039,048—Gas-Cock Lock. George A. Glass, Newark, N. J. Filed February 24, 1912. Serial No. 679,724.

1,039,063—Armored Pneumatic Tire. John Lend, Chicago, assignor, by mesne assignments, to Sanford C. McKnight, Chicago. Filed November 24, 1909. Serial No. 529,803.

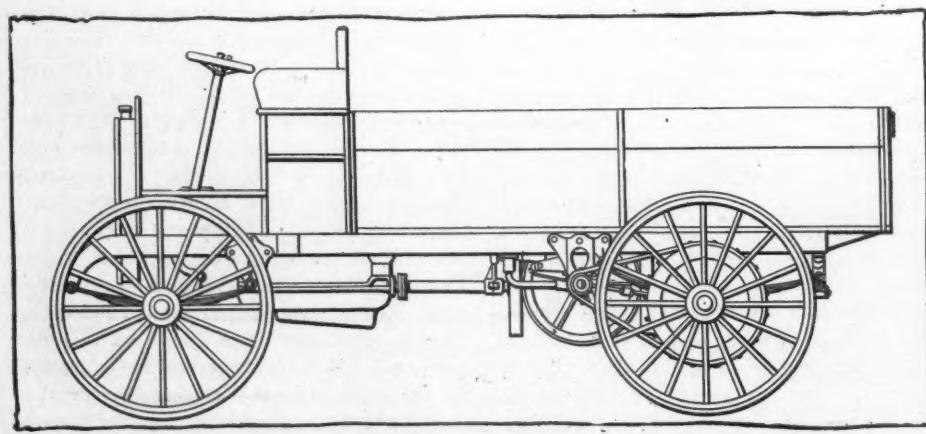
STEPHENSON Friction Drive—No. 1,038,918

To George W. Marble, Chicago, assignor to Stephenson Motor Truck Co., Milwaukee, Wis. Filed January 29, 1910, dated September 17, 1912. This transmission is of the double disk and wheel type, comprising two disks mounted on different portions of a longitudinal driveshaft, between which are two friction wheels mounted on a transversal jackshaft. The disks are disposed with their faces opposing, and each revolves with the driveshaft. The jackshaft is divided independently, one friction wheel driving each division. These friction wheels are linked so they move toward or away from each other, by means of a suitable control, at equal distances from the shaft, so they always are driven at the same speed respectively; variances of their speed in ratio to the speed of the driveshaft are obtainable by such motion. The jackshaft is mounted on movable bearings so it can be moved either forward or back, to engage with one disk or the other, thus driving the shaft either forward or reverse, or to remain in a central position. Chains connect the jackshaft to the wheels.

Make-and-Break Spark Plug—No. 1,038,701

To William Siebert Witter, Julesburg, Colo. Filed February 21, 1911, dated September 17, 1912. To secure a make-and-break low-tension spark in an engine built for the jump-spark system without mechanical changes or additional mechanical appliances, is the purpose of this device. The make-and-break mechanism is electrically operated by means of an electro-magnet. The plug consists of a steel shell, threaded to fit the regular spark plug tap in the cylinder, mounted with an electro-magnetic coil wound upon a hollow core.

Within this core is a firing-pin, disposed within an insulating sleeve, and provided with a sliding guide and a returning spring. The lower portion of this firing-pin is in the form of an electrode, normally in con-



STEPHENSON FRICTION CHANGE-GEAR

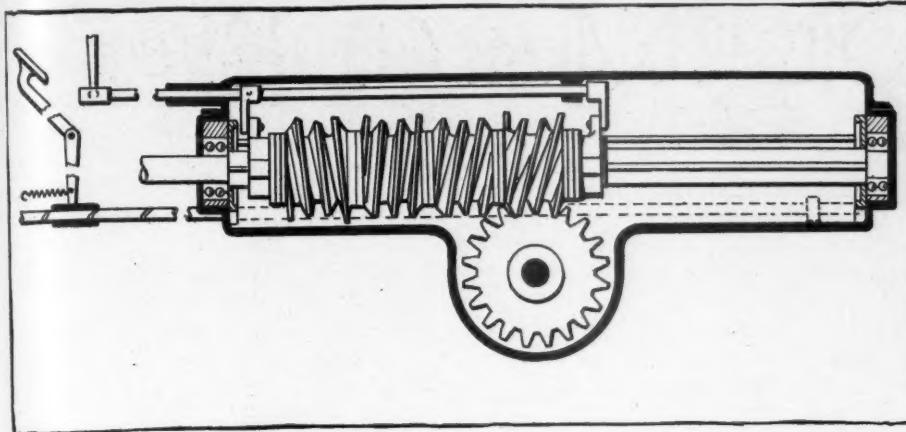


FIG. 3—TWOMBLY VARIABLE-SPEED WORM DRIVE

tact with a sparking point on the plug body. An armature is mounted above the electro-magnet, and also provided with a spring. Upon this armature is a hammer which serves to violently drive the firing pin down upon the drawing down of the armature. The magnet is wired in series with the sparking point and firing pin. The low-tension current is timed and distributed in the ordinary way. When the circuit through the plug is made, the magnet is energized and draws the armature down. In its passage, the attached hammer drives down the firing pin, breaking the internal contact violently, thereby producing a large spark.

Variable-Speed Transmission Mechanism
—No. 1,038,689—To Willard Irving Twombley, New York, assignor by mesne assignments to Twombley Motors Co., New York. Filed April 12, 1910, dated September 17, 1912. Consisting of a worm-drive transmission, this invention comprises a driving shaft, threaded with worms of various pitch and direction, adapted to engagement with a toothed driven wheel. The shaft upon which the worms are disposed is mounted on movable bearings, and may be brought into engagement or out of engagement with the toothed wheel. The worms are disposed on a sleeve, secured to the driving shaft, which may be slid upon the shaft to bring any of the worms, selectively into mesh with the driven sprocket wheel.

Their pitch is such that a given speed in a given direction of the driving shaft will cause the driven sprocket to turn at a different speed for each worm, one or more worms being so cut as to reverse the direction of the driven sprocket. The whole is encased in a suitable housing, and connected to controls adapted to bring the worms out of, or into engagement with the driven sprocket, and to selectively bring any of the worms into operating position. This device eliminates the gearset, but would, of course, require a clutch as usual, and would be controlled in the usual manner.

Four-Wheel Drive—No. 1,038,706—To John L. Yeoman, Chehalis, Wash. Filed December 5, 1911, dated September 17, 1912. For use in connection with a four-

wheel driven motor car, this device consists of a live front axle power-driven, and mounted with two wheels, which are adapted to be steered, and to take the drive at any angle. This is accomplished by a ball mounting of the wheel spindles

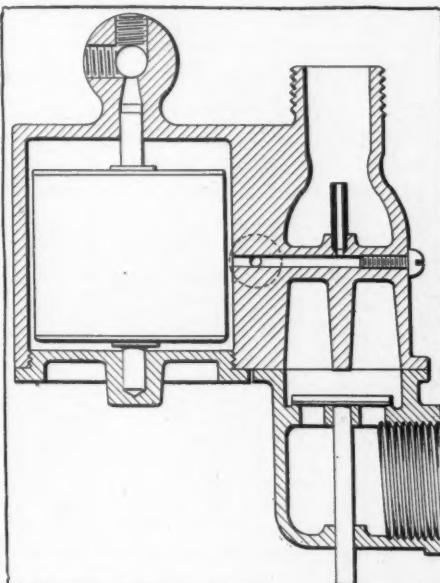


FIG. 4—FRANKLIN CARBURETER

to the axle. Each hub is fitted with a cylindrical projection on the inner side that is internally threaded. Screwed into the first thread is the ball-receiving member that supports the wheel on the axle, and into the other a retaining cap to hold

a loosely-mounted ring to the hub. This ring is mounted between collars, and leaves the wheel free to revolve and to turn, but retains it vertically, being rigidly linked to the steering connections so as to turn with the wheel in steering.

Franklin Carbureter—No. 1,038,699—To John Wilkinson, Syracuse, N. Y., assignor to H. H. Franklin Mfg. Co., Syracuse, N. Y. Filed August 18, 1902, dated September 17, 1912. This invention, which is 10 years old, contains features none the less interesting at the present day. The carbureter is of great simplicity and of the float-feed type, with a single non-adjustable nozzle, and a single air inlet. The design of this portion is the most interesting feature of the instrument. A disk valve with a downwardly extending stem is seated over the air inlet at the lower portion of the mixing chamber. The opening is normally closed, by gravity, the weight of the valve being so determined that the opening of the valve, and consequently the amount of air admitted, is correctly proportioned to the vacuum in the mixing chamber. No adjustments of any nature are provided.

German Headlight Turner—No. 1,038,739—To Joseph Patrick Fox, Chemnitz, Germany, assignor of one-half to Otto Reimann, Chemnitz, Germany. Filed June 16, 1911, dated Sept. 17, 1912. This attachment is for the purpose of turning the headlights of a motor car automatically to conform with the movement of the steering gear, or to operate them manually, independent of the action of the steering gear, at will. This is accomplished by means of a suitable linkage to movable lamp brackets from a revolving sleeve, about the steering column. This sleeve is controlled by means of a pivoted lever normally engaging one of the spokes of the steering wheel spider, and being held so by a spring, but adapted to be turned to clear the spoke, for independent manual operation, or to be locked in a stationary position. The value of this arrangement is, that in running where many turns are to be made, the lamps may be adjusted to turn with the front wheels, while on straight roads, the lamps may be maintained stationary; or they may be turned by hand for exploring.

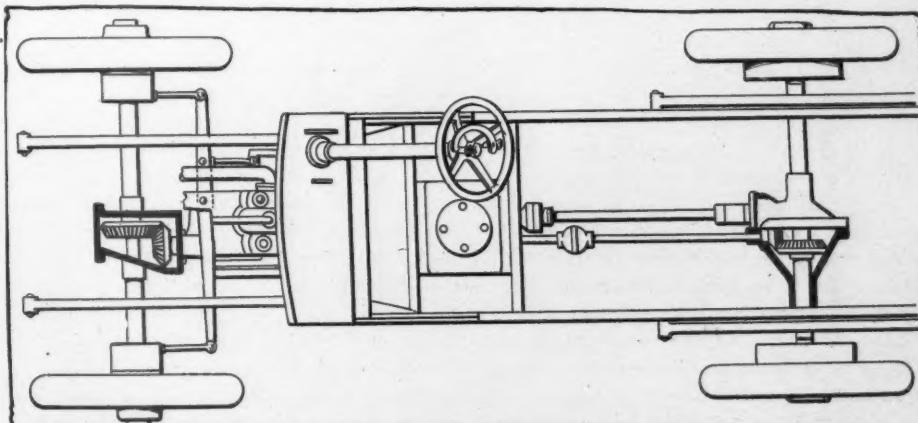
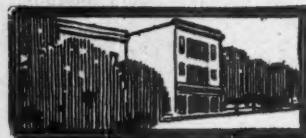


FIG. 5—YEOMAN FOUR-WHEEL DRIVE



Among the Makers and Dealers



HUMPHRIES With Oakland—S. H. Humphries, who has been manager of the Elmore plant at Clyde, O., will take the position of factory manager of the Oakland Motor Car Co., succeeding the late Thomas Wilson.

Change of Name—Papers have been filed with the Secretary of State changing the name of the Middletown Buggy Co., of Middletown, Ohio, to the Crescent Motor Truck Co. The concern will manufacture motor trucks in the future.

Denied by Swinehart—C. A. Swinehart, sales manager of the Swinehart Tire and Rubber Co., Akron, O., denies the report from St. Louis that his company will open a branch factory there. "The new plant announced by J. A. Swinehart will have no connection with the Swinehart Tire and Rubber Co.," he writes. "We have not licensed it or any other firm in St. Louis to manufacture or distribute Swinehart tires."

To Make Vise Plug—The Rapp Mfg. Co. has been incorporated by Toledoans for the purpose of manufacturing a spark plug and other accessories. The capital stock is \$15,000. The plant will be located on the fifth floor of the Snowflake building, Toledo. The chief product will be an indicating spark plug which will locate ignition troubles at a glance and will be known as the Vise spark plug. The officers of the company are: President, Fred Hummel; secretary, C. D. Few; treasurer, Clifford Stone.

Salem's New Garage Law—The committee on ordinances of the Salem, Mass., city government, has drafted a new regulation to cover garages in that city, and it will be adopted by the board of aldermen without much question. It provides that the floor of all garages shall be fire-proof construction, and where five or more cars are stored the entire building shall be fire-proof. Buildings used for electric machines are exempt. Certain allowances are made for garages already built and the storing of gasoline will have to be in tanks on the outside.

Buys Pierce Motor Co. Plant—It is announced that the J. I. Case Threshing Machine Co. of Racine, Wis., has purchased the stock, plant and rights of the Pierce Motor Co., of Racine, which has been building the Case car for the big farm machinery works for 2 years. The Pierce works will at once be consolidated with the immense Case works and lose its identity as a corporation. The change is simply one of name, as the principal stockholders in the Case company in July, 1910, purchased the entire stock issue of the Pierce company from A. J. Pierce and his associates, at the same time that the Case

company purchased the entire output of the Pierce works and began to market the cars under the trade name of Case. Thus the Pierce company has been for 2 years the property of the owners of the Case corporation.

Enlarging Spring Factory—The Hess Pontiac Spring and Axle Co., of Pontiac, Mich., is constructing additions to its factory which will double the output. It is expected ultimately to arrange the factory so that the steel may come into it at one end and emerge as finished product at the other.

May Have Winter Show—Because the motor show in connection with the New England fair at Worcester, Mass., recently was so successful there is now some talk among the members of the Worcester Automobile Dealers' Association, which had charge of the exhibition, of conducting a motor show in some large hall during the winter.

Johnstown in Truck Industry—Adam Trabold, of Johnstown, Pa., is at the head of a new concern which has for its purpose the manufacture of motor trucks. The first one built was recently delivered to the Germania Brewing Co., of Johnstown. This year there will be six more trucks turned out, one of which will be 2-ton capacity. It is his intention to build trucks suited to any business or purpose from 1 to 5 tons. The 1-ton trucks will have a motor of 35 to 40 horsepower and wheelbase of 116 inches.

Remy Increases Factory Building—Ground was broken on September 12 for two new additional fireproof buildings to the plant of the Remy Electric Co., Anderson, Ind. The new buildings will give the Remy factory an increase of 10,600 additional square feet of floor space. They will be completed and equipped within 3 weeks. This addition was made necessary by the volume of magneto business which the Remy company has contracted for during 1913. The factory is at present employing over 1,000 men and working night and day shifts.

New Krit Building—The Krit Motor Car Co., Detroit, is erecting a new service building adjacent to its factory on the East boulevard. This addition is to be used as a service stock room and there will also be a show room in connection. The construction is of brick, one story high. All sides are to be filled with Fenestra sash, giving a very light and airy storeroom. The roof is the sand-tooth construction, liberally fitted with glass. The building is 85 feet wide by 125 feet long, of which 85 by 15 feet will be used for a show room. In the center of the front is a large plate glass window, in which

will be shown the latest Krit models. It is expected that this addition will enable the Krit company to materially better its service department and enable repair parts to be shipped without delaying production of current models.

To Make Brass Castings—The erection of a foundry has been begun in Pontiac, Mich., by the Pontiac Auto Castings Co., composed of men from Detroit and Muncey, Ind. The company will engage in the manufacture of brass castings and later iron and aluminum work will be added to the output. The company is capitalized at \$15,000.

Pope Increasing Plant—To care for a doubled capacity for the coming season the Pope Mfg. Co., Hartford, Conn., maker of Pope-Hartford motor cars, has let bids for a large addition to its present plant. This building will contain four stories and a basement, and will be 192 by 72 feet, and will increase the total floor space of the factory to 70,000 square feet. The building will have walls mostly made of steel sash windows. The column spaces will be wide, and the floors will be shallow, without air spaces. A semi-detached tower will contain all elevators, stairs and toilets, and a runway will lead to a basement garage. The passageway into the plant will be provided through a passageway cut through the building.

New Goodyear Buildings—The new buildings now in course of erection at the plant of the Goodyear Tire and Rubber Co., Akron, O., is indicative of the progress made by this firm in the last year or so. In addition to the buildings recently completed, other structures, to accommodate the increased business, are being built. A new office building to find room for 500 employees, and to relieve the congestion in the old office building, has been occupied recently. The new building has been built as a wing on the east side of the old quarters. It measures 126 by 50 feet. Adjacent to the new administration building is a new two-story garage, 143 by 56 feet, almost completed, with an extra story at the front of the building to be used as an assembly room. The structural iron work of the new No. 6 building has almost been completed. It will measure 403 feet long by 80 feet wide, and will be six stories high with a basement. Excavations are being made for a new five-story building, measuring 250 by 60 feet, and an extension 325 feet by 40 feet is being made to building No. 14. These three buildings are expected to be completed by the end of the year. They will be utilized to meet the increased demand for motor car tires, and the capacity of the plant will be brought to 8,000 tire casings a day. Two stories were added a month

ago to No. 13 building, and this is now a five-story building, also used to increase the capacity of tire output. The Goodyear company also has just completed a new machine shop, 160 by 50 feet, at its Canadian plant at Bowmanville, Canada.

Rhode Island Dealers' Outing—The member of the Rhode Island Automobile Dealers' Association enjoyed their annual outing last week, when a run was made from Providence, R. I., to Lakeville, Mass. The start was made at noon and the place was reached in a short time. Following the games a dinner was served.

After Larger Plant—The Page Auto Hoist Co., of Grand Rapids, Mich., is making negotiations with the common council for a lease of the old lighting plant on South Market avenue, which was abandoned when the city occupied its new lighting and water station on Monroe avenue. The business of the company has increased until it is forced to seek more room.

Making Engines for Durant—Six-cylinder engines for the Sterling Motor Co., which was recently incorporated by W. C. Durant and associates, will be manufactured at the Detroit plant of the Chevrolet Motor Co. until such time as the Flint factory of the Sterling company has been completed. W. C. Durant has been elected president of the Sterling company, Curtis R. Hathaway, of Detroit, is secretary, and William H. Little, of Detroit, general manager.

New in Ignition Field—The R. C. Wells Mfg. Co., a new corporation at Fond du Lac, Wis., has leased a large plant and will engage at once in the manufacture of electric lighting and starting systems for motor cars. The company virtually is the successor of the Duplex Coil Co. of Fond du Lac, Wis., which recently was purchased by the Rueping interests from E. J. Huber and his associates. R. C. Wells was the general manager of the concern, which manufactured coils, batteries, ignition devices and electric lighting systems for the motor car trade. The new corporation is capitalized at \$200,000, the 2,000 shares

being divided into 1,500 common and 500 preferred. The principal product will be an improved electric lighting system designed by Mr. Wells, although the production of all kinds of electrical devices will be continued.

Remys Coming Back—It is reported that Perry and Frank Remy, of Anderson, Ind., are preparing to engage in the manufacturing business and that they will develop devices upon which they have obtained patents during the last year. About 2 years ago they disposed of the Remy Electric Co. to interests represented by Stoughton A. Fletcher, an Indianapolis banker, for approximately \$1,000,000. The plans of the Remy brothers have not been made public.

Berkshire Company's Troubles—Creditors of the Berkshire Motor Co., of Cambridge, Mass., have been notified by attorneys that the company is financially embarrassed. Its liabilities are placed at \$25,000. Although the company has assets of a greater book value than the liabilities the attorneys have found it necessary to liquidate the affairs of the company. This is being done at the instance of the larger creditors. B. Devereaux Barker, an attorney, and James Addison, of the company, have been appointed agents to carry out the liquidation.

Cole Has New Plan—The Cole Motor Car Co., of Indianapolis, has divided the country into territories with district sales managers in charge of certain allotted territory. The idea, according to President Cole, is to give Cole agents and owners stimulated co-operation in having these sales managers keeping in direct personal touch with them. J. R. Moler has been allotted the territory west of the Rockies and the dominion of Canada. C. J. Corkhill takes the territory bounded by the Mississippi on the east and the Rockies on the west. George H. Strout is given jurisdiction over the territory in the southeast and part of the middle west. E. C. Frady, head of the Cole Motor Co., of Chicago, takes the north central states, while William L. Colt, president of the Colt-Stratton Co., Cole eastern distribu-

tors, takes charge of a territory bounded east by a line drawn north from Washington to Syracuse, N. Y. These sales managers will work directly in touch with President J. J. Cole and his sales force in Indianapolis.

V-C Company Under Way—The recently formed V-C Motor Truck Co., organized in Lynn, Mass., with Frank S. Corlew president and salesmanager and Frank E. Vallier treasurer and general manager, has secured temporary offices at 15 Willow street. The company has some well known men affiliated with it, among them being John M. Nelson, John P. Stevens, William T. Langmaid, J. P. Crosscup, Charles M. Alley, and S. D. Ritchey. The company is seeking a factory site at Lynn.

New Rambler Building Ready—An imposing sales and service building in Boston is to be opened the first week in October by the Thomas B. Jeffery Co. The building is in the newer Back Bay district, Commonwealth avenue and Hinsdale and Cummingston streets. It is a four-story, fireproof structure, 216 feet long, with a frontage on Commonwealth avenue, and is set back 127 feet with an open space attractively graded and laid out. The property has been leased for a term of 12 years at a rental of \$102,000. The total floor area is 60,000 square feet. The building will be used for show rooms and sales service headquarters of the Thomas B. Jeffery Co. for Boston and its vicinity.

Overland Changes—President John N. Willys, of the Willys-Overland Co., has brought the traffic departments of most of his properties under one head, with headquarters at Toledo. C. W. Eggers, who for the past 2 years has been traffic manager for the Willys-Overland Co., has been made general traffic manager for the Willys-Overland Co., the Garford Co., Elyria, O., the Gramm Motor Truck Co., Lima, O., Federal Motor Co., Indianapolis, Ind., and Morrow Mfg. Co., Elmira, N. Y. Other changes made was the removal of sales manager J. D. Porter, of the Garford company, with his headquarters from Toledo to Elyria.



FISK RUBBER CO. BRANCH MANAGERS, SALESMEN AND OFFICIALS AT ANNUAL CONVENTION

Development Briefs in Accessory Field

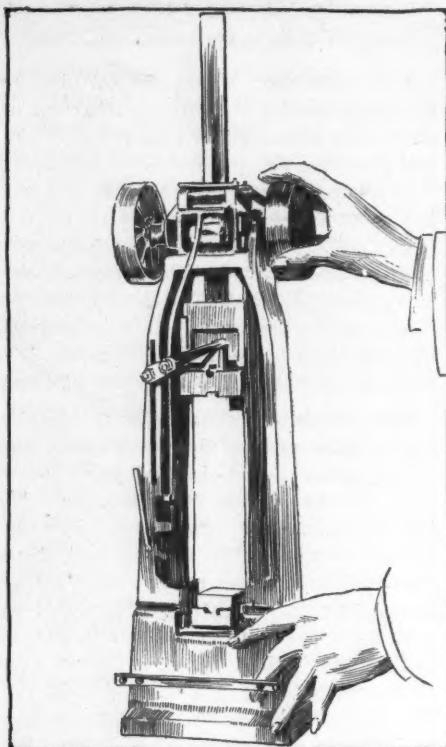


FIG. 1—BILLINGS & SPENCER MODEL

Woeber Demountable Rim

RECENTLY patented by A. Woeber, of Davenport, Iowa, the demountable rim Fig. 4, contains several new and interesting features. As shown in the sectional figure, this rim consists of the usual rim base and felloe band, the former bolted rigidly to the felloe of the wheel, and the latter beaded in the usual manner for the reception of a pneumatic tire. On the inner surfaces of these elements are flat

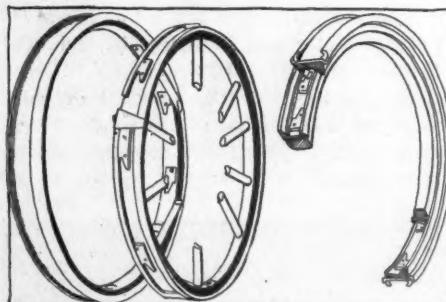


FIG. 2—WOEBER RIM AND SECTION

spaced adjusting wedges, and at the back and front of the rim base are annular bevels, and on the felloe band corresponding surfaces. To apply the rim to the wheel, the straight faces of the adjusting wedges are brought together, and the rim slid on to the wheel. The wedge pieces thus clear each other. The tire and rim are then revolved upon the wheel, the wedges drawing the rim back on the felloe band, and jamming the bevelled faces together, making one tight junction of the two members. A locking wedge is then

Suggestive Sale Method Used by Machine Makers —Latest Demountable Rim—New Principle in Cushioning Road Vibration—Starter Uses Three Fuels

inserted in a groove, opened by this revolution of one member upon the other, which locks the adjusting wedges against revolution backward. This latter piece is held in place by a retaining nut, which besides the locking wedge, is the only loose member of the assembly.

To demount the rim it is only necessary to remove the nut, revolve the rim back until the straight faces of the adjusting wedges contact, when the wedges will clear one another, and the bevels be separated, when the rim is easily pulled off.

Starter and Low-Speed Carbureter

Using gasoline, kerosene, or acetylene as a fuel, and being adapted to run the engine economically at low speeds, the Wackenmuth starter and slow-speed auxiliary carbureter, Fig. 6, is designed to start the motor, permit the use of a larger carbureter than otherwise, and to use low-grade distillates and kerosene as fuel. The starting device consists of a cylinder pump, P with a throttle at T, and a bypass B leading from the supply tube S to the injector tubes I, which lead to the spark plugs of the motor. These are of special construction, having a gas passage and ball check-valve, as shown. M, the gasoline mixer, which is applied to the regular carbureter, is connected to the supply pipe of the starter. X, the acetylene mixer, for the purpose of mixing gas with air, may be connected also to the starter, with the gasoline mixer, through a three-way valve. To start, the throttle T is closed by means of the attached control rod, and the hand pump worked, to charge the cylinders with gas. The engine is then started on the spark, and the throttle opened. To run on kerosene, the mixer is applied to an independent float chamber. Fredrick Wackenmuth, Newark, N. J., is the manufacturer.

Duryea's Starter

In use on the Duryea Buggyaut, the starter shown in Fig. 4, consists of an arm turning on the crankshaft next the flywheel, with a pawl at its extremity, which engages with slots in the periphery of the flywheel. To this arm is attached a steel band, held normally away from the wheel by its own spring, and attached to a cord, which is connected with a spade handle convenient to the driver's hand. In operation, the handle is pulled to start the motor, the arm being drawn around an arc of approximately 180 degrees, the pawl engaging with the flywheel, and turning it over one compression. This is equal to one crank turn, and may be repeated as many times as desired, the pawl being disengaged from the flywheel on returning to

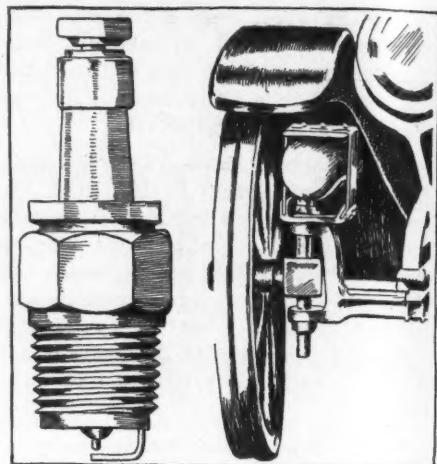


FIG. 3—BEHEN PLUG AND KLENKE SUSPENSION

the lower point on the circumference, where it strikes a lug, which raises it from the slot. This action prevents harmful results from a back fire.

Klenke Pneumatic Suspension

By moving the resilient element from the tire of the wheel to the protected position afforded by the location shown in Fig. 3, the suspension device which is the product of the Klenke Pneumatic suspension Co., New York, is offered as a substitute for pneumatic tires. Its application to the front wheels is shown in the figure. The wheel spindles are secured to the king bolt, which slides in the axle yoke, a pneumatic rubber cushion being disposed between seats secured respectively to these elements. By this position the cushion is protected from road wear and injury, at the same time imparting the same cushioning effect on the parts above it as pneumatic tires, it is claimed. Applied to the rear axle of a chain-driven car, the cushions are disposed between the axle and the springs; while on the shaft-driven type,

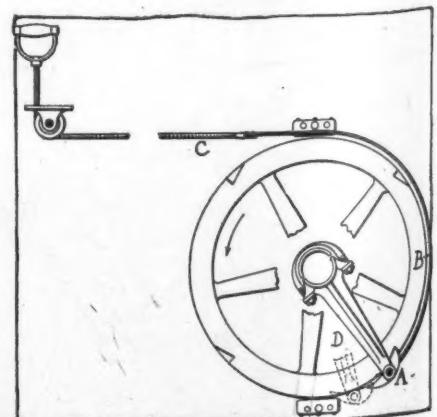


FIG. 4—STARTER FOR BUGGYAUT

Novelties for Use of the Motoring Public

Zenith Carbureter Has Improved Low-Speed Feed Mechanism—Novel Air Valve for Hupmobile Carbureter—Flat Canvas Pail Solves Water Problem

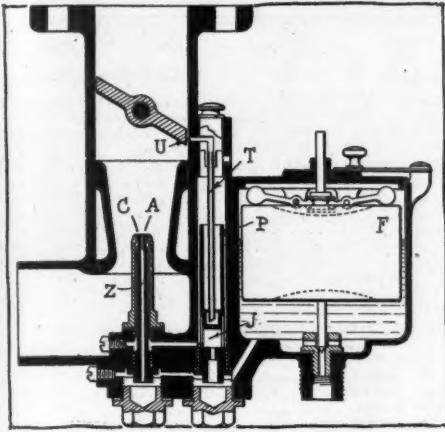


FIG. 5—ZENITH CARBURETER

the whole axle system is changed. The differential is carried amidships, as a sprung member, driving to the wheels by individual shafts, the cushions being interposed between the springs and the axles. The pressure in the cushions is obtained by inflation in the same manner as a pneumatic tire.

Zenith Carbureter Improvements

The Zenith carbureter, described in the Readers' Clearing House columns of Motor Age in the issue of June 27, 1912, has undergone slight improvements in the device which supplies gasoline for light running. In Fig. 5, is shown the improved mixer. A dual concentric main nozzle, Z, is supplied direct from the float chamber, F, through its center aperture, C, and from a compensating open well, at J, for the annular aperture about the central portion of the nozzle, A. The secondary supply, being open to the atmosphere, is dependent upon gravity alone for its pressure. This provides a relatively rich mixture for low

speeds and when running slowly, which becomes impoverished as the speed increases. The direct nozzle is directly affected by the engine suction and tends to compensate the action of the other; to provide correct mixture for all speeds. For starting and very low speeds, such as idling, an auxiliary jet, U, is provided in the throat of the carbureter. The action is restricted to very slight throttle openings, when the suction at the main nozzle is very low, but at the small opening at the auxiliary nozzle, U, great enough to raise the gasoline from its normal level in the well, J, through the supply tube, T. The improvement consists of a secondary well, P, whose purpose is to measure the supply for slow motor speeds.

Another improvement, which is for the special instrument furnished by the Zenith company for the Hupmobile car, consists of a rotary-sleeve air valve. This valve, Fig. 8, consists of a rotary slotted sleeve, which may be adjusted to close the air intake port in the mixing chamber, to open it and the hot-air intake, which leads to an exhaust pipe connection, or to register with the cold air port in the valve body. The interior of the tube forms the hot-air passage.

Behen Spark Plug

Marketed by the Behen Automobile Equipment Co., St. Louis, Mo., and manufactured by the Jeffery-Dewitt Co., Detroit, the Behen Spark Plug, is shown in Fig. 3. The insulation is of porcelain, with meteor steel electrodes. The cap is crimped on by a special process, and the binding nut is arranged to take all brands of slip or ring terminals, being made of case hardened steel. The plug is made in standard taper threads.

Novel Sales Method

Models to illustrate the operation of mechanical devices are not new, but the use to which the model in Fig. 1 is put is rather unusual. From its size, as compared with the fingers of the demonstrator, one is at a loss at first to identify the device, its scale of reduction being so great as to be somewhat deceiving. The Billings & Spencer Co., Hartford, Conn., having embodied improvements in their line of drop hammers, which were of such nature that their operation required to be shown in order to be appreciated, determined to send out samples with their salesmen. As a full-sized drop hammer weighs several tons, it was decided that such would somewhat inconvenience the demonstrator who desired to have his samples with him, and a number of models



FIG. 7—THE WAUTO PAIL

were made, one of which is shown in the figure. The feature that was desired to be shown in operation consists of an improved board clamp that makes unnecessary the usual latch and connections at the side for holding the ram suspended. This device is located at the extreme top, above the friction rolls, where it is free from grease, and consists of a powerful clamp, operated by the lever on the left leg of the frame.

Folding Water Pail

Every motorist at some time has had the embarrassment of being in need of water,

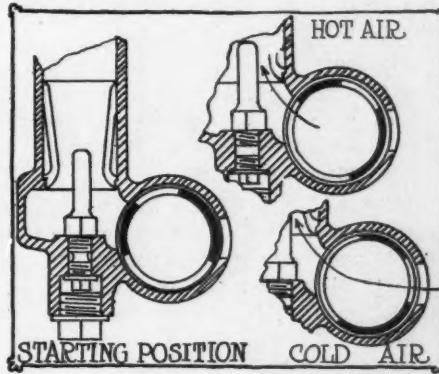


FIG. 8—ZENITH-HUPP AIR VALVE

when out on a country road, without adequate means of carrying it. Numerous folding pails have been offered from time to time to fill this need, many of which were made of canvas. The Wauto Pail Co., New York, is one of the first to offer a substantial canvas pail of 2 gallon capacity, which dispenses with a funnel, and folds perfectly flat, being adapted to storage beneath a seat cushion. The Wauto pail is made entirely of canvas, as is shown in Fig. 7, and when not in use, consumes a negligible amount of space. The small size of the opening at the top prevents splashing in carrying.

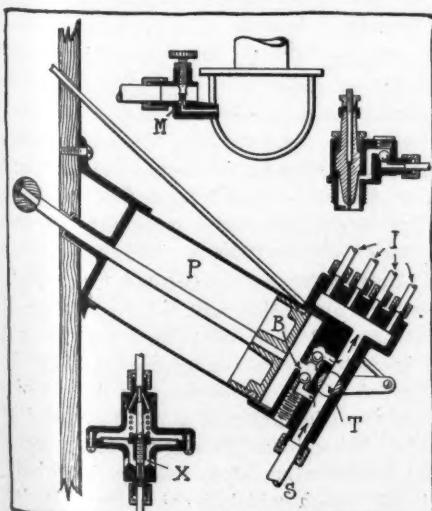
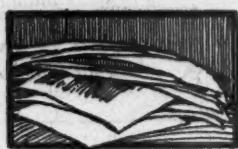


FIG. 6—WACKENMUTH STARTER



Brief Business Announcements



Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Towns—	Agent	Car
Abilene, Tex.	C. N. Manly	Franklin
Albany, N. Y.	C. S. Ransom	Lozier
Albany, N. Y.	Park Garage Co.	Hupmobile
Albany, N. Y.	Northern Motor Car Co.	Stutz
Aledo, Ill.	E. B. Miller	Moon
Amboy, Ill.	Andrew Aschenbrenner	Franklin
Boston, Mass.	B. W. Atwood	Mora
Boston, Mass.	R. & L. Co.	Garford
Boston, Mass.	Tyler Motor Car Co.	Little
Boston, Mass.	Anderson Mfg. Co.	Detroit
Bradford, Pa.	Smith Agency	R.C.H.
Brockton, Mass.	Bullock Motor Car Co.	Bulck
Cambridge, Md.	E. J. Brannock	Detroiter
Chestertown, Md.	J. W. Russell	Detroiter
Crisfield, Md.	L. S. Nock	Detroiter
Charleston, Mo.	Luke Howlett	Moon
Columbus, O.	Warren and Southwick Co.	Cutting
Columbus, O.	Warren and Southwick Co.	Imperial
Columbus, O.	Cummins Auto Sales Co.	Krit
Columbus, O.	Glancy & Sellas	Rambler
Coshocton, O.	Charles W. Loos & Sons	Ford
Coshocton, O.	Charles W. Loos & Sons	Overland
Coshocton, O.	Charles W. Loos & Sons	Rambler
Coshocton, O.	Standard Auto Co.	Imperial
Decatur, Ill.	North Main Street Garage	Moon

Town	Agent	Make
Harrisburg, Ill.	Charles V. Parker	Moon
Havre de Grace, Md.	Sanders Machine Shop	Detroiter
Kinderhook, N. Y.	George H. Brown & Bro.	Studebaker
Lawrence, Mass.	Lambert Mrlin Motor Vehicle Co.	R.C.H.
Memphis, Tenn.	Chickashaw Motor Car Co.	Moon
Martinsburg, W. Va.	Shenandoah Garage	Detroiter
Pekin, Ill.	O. L. Cottingham	R.C.H.
Petersburg, Va.	George B. Carter	Detroiter
Ravenna, N. Y.	Snyder Bros.	Studebaker
Rice Lake, Wis.	Crisler & Co.	R.C.H.
Rosenberg, Tex.	Rosenberg Motor Car Co.	Moon
Seattle, Wash.	I. D. Lundy Co.	R.C.H.
St. Louis, Mo.	J. D. Lewis	Moon
St. Louis, Mo.	Bond Automobile Co.	Glide
Sioux City, Ia.	Bennett Auto Supply Co.	Moon
Taylor, Tex.	Prewitt Auto Co.	Moon
Taneytown, Md.	George W. Demmitt	Detroiter
Temple, Tex.	J. E. Brown	R.C.H.
Texarkana, Ark.	Paul Jones	Moon
Toledo, O.	Moon Sales Co.	Moon
Portsmouth, Va.	A. E. Harmon	Detroiter
Punxsutawney, Pa.	G. Frank Porter	Moon
Utica, N. Y.	Westcott Garage Co.	Lozier
Utica, N. Y.	I. R. Gardiner	Elmore
Winchester, Va.	E. A. Rogers	Detroiter

TRUCKS

Baltimore, Md.	Norwood Bros., Inc.	Veerac
Boston, Mass.	Westfield Motor Truck Co.	Westfield
Boston, Mass.	B. W. Atwood	Adams
Calgary, Alberta	H. H. Kerr	Kisselkar
Carbondale, Ill.	Charles F. Hamilton	Kisselkar
Erle, Pa.	Stirling Bros. Co.	Lippard-Stewart
Jersey City, N. J.	B. & H. Garage	Kisselkar
Marinette, Wis.	Myron R. Churchill	Kisselkar
Mineral Wells, Tex.	L. M. Dunn	Kisselkar

Mont'l, Que., Can.	J. D. Lapointe	Kisselkar
New Rochelle, N. Y.	H. H. Fuller & Co.	Kisselkar
Phoenix, Ariz.	Wesley A. Hill	Kisselkar
Portsmouth, O.	David Stahler	Lippard-Stewart
Regina, Sask., Can.	D. L. Bourreau	Kisselkar
San Angelo, Tex.	W. A. Bell	Kisselkar
Syracuse, N. Y.	George Finck	Kisselkar
Salisbury, Md.	L. D. Collier	Kisselkar
Utica, N. Y.	I. R. Gardner	Krebb

DEFIANCE, O.—A. G. McClary is building a modern garage 44 by 132 feet.

Brockton, Mass.—The Boston branch of the Buick Motor Car Co. has opened a branch in Brockton and George H. Connor has been sent here to manager it.

St. Louis, Mo.—The Locomobile Co. of America will open a factory branch in St. Louis, with A. L. Ellwood as manager. The office and salesroom is located on Locust street.

Detroit, Mich.—C. E. Havens has resigned his position as manager of the technical and service department of the Abbott Motor Co. and is taking an extended vacation in an effort to recover his health.

Omaha, Neb.—The Drummond Motor Co., which handles G. M. C. trucks, has just moved into its new garage at Twenty-sixth and Farnum streets. The Drummond Company, formerly the Drummond Carriage Co., has occupied the same corner at Eighteenth and Farnum streets for 24 years.

Racine, Wis.—John H. Dwight, manager of the motor car body and wagon departments of the Mitchell-Lewis Motor Co. of Racine, Wis., has resigned to become president and general manager of the Belle City Malleable Iron Co. of Racine, Wis., which does a large business in supplying motor car manufacturers with castings of all kinds. Mr. Dwight succeeds W. C. MacMahon, who has become vice-president

and manager of the Northwestern Malleable Iron Co., Milwaukee.

Toledo, O.—Frederick Seyfang has purchased the Twenty-second street garage and will operate under the name of the Star garage.

Merrill, Wis.—Norman Chilson of Merrill, Wis., is building a three-story addition, 40 by 75 feet, to his garage, making it one of the largest in Wisconsin.

Milwaukee, Wis.—The Essenkay Co. of Chicago has established a Wisconsin branch at 482 Milwaukee street, Milwaukee, with W. A. Knowles as manager.

Milwaukee, Wis.—The Ph. Gross Hardware Co., 126-128 Grand avenue, Milwaukee, one of the largest supply and accessory houses in Wisconsin, is building a ten-story brick and steel store building at 173-177 Third street, a large part of which will be devoted to the wholesale and retail motoring department, now a feature of the extensive business established 60 years ago.

Boston, Mass.—The final arrangements were completed last week whereby the R & L Co. of New York, comprising J. T. and J. A. Rainier, and Paul Lineberger, took control of the Garford business in Boston to operate in connection with the New York agency as a sub branch. The building formerly occupied by the Boston branch of the Thomas Motor Car Co., Boylston street, has been leased and the Garford product, trucks and cars, will be

marketed from there. P. C. Chrysler has been placed in charge as manager.

Detroit, Mich.—The Foster Motor Sales Co., state distributor for Cutting cars, has secured the services of T. E. Ball as sales manager.

Detroit, Mich.—Don Ferguson has severed his connection with the Studebaker Corporation to accept the position of chief engineer with the Cartercar Co. of Pontiac, Mich.

Minneapolis, Minn.—L. J. Hadley, vehicle division for the Studebaker corporation of Minnesota, has become manager of the truck sales for the Northwest Kisselkar branch.

Albany, N. Y.—Samuel S. Shaw has been succeeded in the management of the motor car department of the W. M. Whitney & Co., Albany, by Westcott Burlingame, of Albany, formerly connected with the United Motor Albany Co. Within a few weeks Mr. Shaw intends to incorporate a new company in Albany.

Detroit, Mich.—On October 1, the Studebaker Corporation will take over the new garage and show room at Woodward and Charlotte avenues now occupied by the United States Motor Co., the deal involving a consideration of about \$100,000. The Studebaker interests will use the property as headquarters of a recently formed Detroit branch which is at present located at Studebaker plant No. 1 on Piquette street. The new headquarters will be

managed by A. K. McLundy, Michigan sales manager.

Philadelphia, Pa.—The EssenKay Co., manufacturer of a tire filler, has established a branch at 1927 Market street.

Cincinnati, O.—The Republic Tire Co. has opened up a new agency at 915 Race street, Cincinnati, with R. W. Llewellyn in charge.

Philadelphia, Pa.—The James L. Gibney Co. of this city, is remodeling the J. Ellwood Lee plant at Conshohocken for the manufacture of truck tires.

Boston, Mass.—The Page Co., Lynn, Mass., maker of P & P tire filling, has discontinued its branch in Boston, and it will be handled later on an agency basis.

Toledo, O.—The Banting Machine Co., carriage and motor car dealer, will remove from its present location to the new M. O. Baker building, 120-24 Superior street, in a short time.

St. Paul, Minn.—Felix Joswich, of the St. Paul Motor Vehicle Co., has bought the Pence Automobile Co. building, West Fifth street, and will continue the sale of Buick cars in St. Paul.

Detroit, Mich.—Garvin Denby, brother of Senator Edwin Denby, has resigned his position as assistant to the president of the Solvay Process Co., to assume the position of sales manager of the Federal Motor Truck Co.

Buffalo, N. Y.—The Baker Brothers Motor Co., formerly located at 846 Main street, has moved into the building at 1227-1229 Main street, which was formerly occupied by the sales department of the E. R. Thomas Motor Car Co.

Milwaukee, Wis.—The Sternberg Mfg. Co. has opened a direct factory service branch and maintenance bureau in New York city, operated by the Sternberg Motor Truck Co., of New York, at 285 East One Hundred and Thirty-seventh street.

Buffalo, N. Y.—Plans have been completed for the construction of the new home for the Poppenberg Motor Car Co. at Main and Carlton streets. The mansion on the site at present is being razed for the new structure which will be seven stories in height and will extend from Main to Washington streets.

Pittsburgh, Pa.—The Ohio car will be represented in the Pittsburgh territory by the Ohio Motor Sales Co. of Pittsburgh, temporary headquarters having been secured at 5712 Penn avenue, pending the completion of new sales room and service station. The Ohio's new Pittsburgh dealer succeeds the Federal Motor Car Co.

Cleveland, O.—Royal B. Curtiss, who up to September 1 was sales manager of the Royal Equipment Co., resigned his position to accept a district management of the Chase Motor Truck Co. with headquarters in Cleveland. Mr. Curtiss will have jurisdiction over the following territory: Ohio, West Virginia, Kentucky, Indiana, except

the vicinity of Chicago Michigan and Western Pennsylvania.

Washington, D. C.—The National Auto Supply Co. has opened a store at 1530 Fourteenth street, N. W., with Frank G. Fickling as manager.

Denver, Colo.—The Cole Motor Co., Denver distributor for the Cole, has moved into new sales rooms and a service station at the corner of Lincoln and Colfax streets.

Omaha, Neb.—Doty & Hathaway, dealers in the Little Four and Reo cars, have moved into the garage at Twenty-first and Farnam streets, formerly occupied by the Kimball Auto Co.

Milwaukee, Wis.—John J. Kroha, former contracting freight agent for the Wabash system in Milwaukee, has been appointed Milwaukee representative of the motor truck division of the A. O. Smith Co. of Milwaukee.

Boston, Mass.—Wallace G. Page, for several years connected with the Shawmut Tire Co., as sales manager, has become associated with George S. Van Voorhis, in the American Marine Equipment Co., of Boston, dealer in motor supplies and specialties.

Philadelphia, Pa.—Petrey-Cassidy, Inc., selling agents for the Weed chain tire grip, the New York and New Jersey Lubricant Co., Standard Woven Fabric Co., Jones speedometer, etc., for a number of states, has removed from 1416 Vine street to 1427-29 Vine street.

Boston, Mass.—The Boston agency for the Franklin cars has been moved from 31 Irvington street to 733 Boylston street in the salesrooms formerly occupied by the Marquette company. The company is considering plans for a large building on Commonwealth avenue.

Baltimore, Md.—The Goodyear Tire and Rubber Co. branch in this city, Frank M. Olmstead manager, is erecting a new building at the northeast corner of Cathedral and Preston streets. The building will be fireproof throughout and will be of two stories and basement. It will have a frontage of 32 feet and a depth of 100 feet.

Boston, Mass.—B. W. Atwood, for some time with the Curtis-Hawkins Co., agent for the Speedwell, has gone into business for himself, having taken on the agency for the Mora car and the Adams truck. He is located now at 1000 Boylston street, sharing the same salesrooms with the Williams Brothers, who handle the Carter cars.

Boston, Mass.—The Baker commercial and pleasure vehicles are now being handled under the same roof in Boston though by distinct agencies, A. F. Neale, who has the pleasure cars and Frank A. Phelps who handles the commercial line having moved their quarters, Neale from the Motor Mart and Phelps from 17 Harvard street to the former salesrooms of the

King agency, corner of Boyleston and Fairfield streets.

Milwaukee, Wis.—The Milwaukee Auto and Tire Exchange, 461 Broadway, Milwaukee, has been appointed agent for Swinehart tires.

Westfield, Mass.—The Westfield Motor Truck Co. has opened a factory branch at Boston at 287-293 Northampton street with George L. Cooke in charge as manager.

St. Paul, Minn.—The Studebaker Corporation has opened its St. Paul headquarters in the former German Evangelical church on West Sixth street. R. A. Briggs is manager.

Detroit, Mich.—C. L. Morgan, formerly sales manager of the electric division of the General Motors Truck Co., has resigned to take a position with the Moon-Hopkins Billing Machine Co. of St. Louis.

Boston, Mass.—Louis Sackett, recently appointed manager of the Boston branch of the Oakland, has resigned and the branch is being conducted now by Fred Walsh, sales manager of the branch for some years.

Niagara Falls, N. Y.—Plans have been completed by George L. Gaiser for the construction of a completely equipped garage to cost \$50,000. Property in Main street, 220 by 66 feet, has been purchased, the consideration being \$15,000.

Detroit, Mich.—The Grant Brothers Auto Co. has secured the sales and distributing agency for the Lozier cars in Detroit and surrounding territory. In making this change the Lozier company gives up its factory branch on Jefferson avenue. The Grant sales rooms are on Woodward avenue which is a superior location to the former show rooms of the Lozier car.

Boston, Mass.—The Tyler Motor Car Co., formed by Frank J. Tyler and his brother Lucius, both of whom were prominent in the affairs of the United Motors Boston Co. until recently, has secured quarters in the Motor Mart formerly occupied by the Buick company and for a starter has taken on the Little roadster, which is made in Flint, Mich.

Baltimore, Md.—The Schall-Crouch Auto Co., of this city, headed by Percy W. Schall and Harry M. Crouch, has closed a contract for the agency in Baltimore and the counties of Maryland of the Lozier. This company is located at North and Mount Royal avenues and also is the representatives in this section for the Paige-Detroit car.

San Francisco, Cal.—Fred W. Hauger, several years assistant manager of the Haynes Auto Sales Co. of this city, has been named as manager of the Oakland branch of the Haynes. The Haynes business in this territory is now conducted as a direct factory branch, under the general management of W. B. Cochran. C. H. Haynes, a brother of Ellwood

Haynes, has been appointed treasurer under the reorganization.

Utica, N. Y.—I. R. Gardner is planning the construction in this city of a large garage.

Detroit, Mich.—J. I. Clarke, formerly with the Boston Post, has taken a position in the advertising department of the Chalmers Motor Co.

Minneapolis, Minn.—J. E. Kemp and D. W. Kemp have opened the Electric Service garage, at Bryant and Hennepin avenues, for the care of electric machines solely.

Washington, D. C.—Miller Brothers, agents for the Stutz, have leased 1026 Connecticut avenue, N. W., formerly occupied by the Goodyear Tire and Rubber Co., and after extensive improvements will take possession.

Waterbury, Conn.—Michael Norton, prominent in the taxicab business at Providence, R. I. and other places, has completed arrangements for a new company at Waterbury, of which he will be treasurer and the controlling stockholder.

Davenport, Ia.—A. Leberman and G. V. Davis have taken over the Davenport Auto Co., 114 West Fourth street, up to the present time under the management of Steinhauer & Frey. They will handle the Krit and Apperson and run a taxi line.

Detroit, Mich.—The Peninsular Steel Castings Co., a newly organized concern, which will manufacture crucible steel castings under the Nice furnace patent, has purchased the property formerly occupied by the Michigan Bolt and Nut Works for a consideration which is not made public. The property, which is appraised at \$52,000, fronts 371 feet on Iron street and

100 feet on Wight street. The building has a length of 235 feet.

Philadelphia, Pa.—The local branch of the Polack Tire Co. will remove from its present headquarters on North Broad street to 1803 Market street.

Phoenix, Ariz.—R. Alyn Lewis has secured the Arizona agency for Essentay. He will establish headquarters here and branches throughout the state.

Cincinnati, O.—The Bond Hill Auto Service Co., of Cincinnati was incorporated last week with a capital of \$2,000. The Cincinnati Automobile Co. was incorporated with a capital of \$25,000.

Philadelphia, Pa.—A one-story fireproof addition containing 9788 square feet additional floor space has just been completed by the Packard Motor Car Co. in the rear of the present structure at 317 North Broad street.

Portland, Ore.—C. S. Mantell, formerly manager of the Portland Motor Car Co., has recently taken charge of the sales department of the Michigan Motors Co. of Portland, handling the Havers six and Lippard-Stewart.

Milwaukee, Wis.—The New York Tire and Vulcanizing Co. has been formed at Milwaukee, by Vivian and Bertrand Brownell, with headquarters at 609-611 Wells street. The company will manufacture an inner liner for casings.

Boston, Mass.—The Detroit electric, formerly handled as an agency proposition by James A. Binney in Boston, has been changed over to a branch by the Anderson Electric Co., of Detroit, and Albert Weatherby has been sent to Boston as manager. A new service station has been opened at 25 Irvington street with Nicholas Rommefauger in charge. Mr. Binney

has gone into the gasoline field, having taken on the Henderson.

Pittsburgh, Pa.—The National Motor Car Co. has moved into its new show rooms at Baum and Beatty streets, where the National is handled.

Detroit, Mich.—The traveling staff of the Federal Motor Truck Co. has been augmented by George Friend, formerly with the Mitchell Motor Car Co.

Milwaukee, Wis.—The Northern Sales Co. of Toledo, O., general distributor of the Air Friction carburetor, has established a branch sales office and service station at 490 Twelfth street, Milwaukee.

Montreal, Can.—The Hart Accumulator Co. of London, Eng., manufacturer of storage batteries, will establish a factory in western Canada. E. J. Clark, managing director of the company will recommend that a large plant be built at either Winnipeg or Fort William.

Boston, Mass.—The W. L. Russell Co., agent for the Haynes in Boston, and the Regal wholesale and retail for New England, has moved its executive and wholesale offices to the Motor Mart, still retaining the retail branch at 10 Park square. A large section of the second floor of the Motor Mart has been leased and a mezzanine floor built in to give additional room.

Rochester, N. Y.—Arthur McNall has moved into his new garage at South Union street and East avenue. The new place of business has frontage of 85 feet and is three stories in height. The showroom is 42 by 60 feet and is finished with stamped steel ceiling and terrazzo floor. Mr. McNall will continue to handle the Peerless, Chalmers, Rauch & Lang electric and the Peerless truck.

Recent Incorporations

Atlantic City, N. J.—Pierson-Harris Co.; capital stock, \$50,000; incorporators, G. Harris and others.

Baltimore, Md.—Automobile Tire Repairing Co.; capital stock, \$500; to repair tires; incorporator, L. Vernon.

Boston, Mass.—Motor Service Co.; capital stock, \$2,500; incorporators, S. Small, H. Chisholm, W. H. Evans.

Buffalo, N. Y.—Buffalo Resilio Co.; capital stock, \$25,000; to manufacture and deal in tire fillers; incorporators, S. D. Noble, A. D. Falck, P. E. Lonergan.

Cincinnati, O.—Bond Hill Auto Service Co.; capital stock, \$2,000.

Cleveland, O.—Gerhart Spring Tire Co.; capital stock, \$15,000.

Columbus, O.—Pioneer Gasoline Co.; capital stock, \$10,000; incorporators, E. J. Chernen and others.

Flint, Mich.—Sterling Motor Co.; capital stock, \$300,000.

Harrisburg, Pa.—Economy Tire and Rubber Co.; capital stock, \$5,000; incorporators, E. M. Knupp and others.

Indianapolis, Ind.—Martin Tractor Co.; capital stock, \$250,000; to manufacture tractors; directors, C. H. Martin, H. R. Richards, E. D. Moore.

Indianapolis, Ind.—Showalter Mfg. Co.; capital stock, \$10,000; to manufacture motor car bodies; directors, H. G. Showalter, F. W. Showalter, W. Small.

Indianapolis, Ind.—Glover Equipment Co.; capital stock, \$20,000; to manufacture motor car accessories; directors, F. L. Glover, L. Gieger, W. A. Uphrey, L. A. Libkins.

Johnstown, Pa.—United States Motor Sales Co.; capital stock, \$50,000; incorporators, M. S. Marquis, R. M. Buchanan, J. H. Miller, G. G. Stitzinger, A. W. Reynolds, R. L. McNabb.

Kansas City, Mo.—Rambler Distributing Co.; capital stock, \$10,000; incorporators, E. C. Ellis, G. D. McIlrath, R. K. Dietrich, H. H. Cook, R. C. Barnett.

Kingston, N. Y.—Rondout Rubber Co.; capital stock, \$1,000,000; to deal in crude rubber; incorporators, Henry T. Clews, Frank C. Brennan, C. Tompkins.

Little Rock, Ark.—Newsum Auto Tire Vulcanizing Co.; capital stock, \$10,000; to manufacture tires and accessories.

Louisville, Ky.—George L. Waller Co.; capital stock, \$5,000; incorporators, George L. Waller, S. J. Brown, M. S. Howard.

Marlinton, W. Va.—Marlinton Garage; capital stock, \$10,000; to deal in motor cars and conduct garage; incorporators, E. T. McClinton, C. A. Yeager, M. E. Pue, G. R. Goodsell, L. S. Shoemaker, G. W. Clark.

New York—Motor and Gear Improvement Co.; capital stock, \$1,250,000; to manufacture car parts; incorporators, H. C. Derham, S. V. Brady, D. Partridge.

New York—Auto Despatch Bureau; capital stock, \$25,000; incorporators, W. Stackhouse, H. Parker, L. S. Parker.

New York—Englebert Tyre Co.; capital stock, \$100,000; incorporators, S. K. Kellock, C. B. Campbell, E. W. Elverson.

New York—Miller, Hicks & Hewitt, Inc.; capital stock, \$10,000; motor car business; incorporators, H. D. Miller, H. T. Hicks, G. A. Hewitt.

New York—Cameron-Rowe Auto Service, Inc.; capital stock, \$10,000; incorporators, J. Cameron, N. Cameron, A. T. Rowe.

New York—Mercedes Daimler Selling Corp.; capital stock, \$50,000; to deal in motor cars; incorporators, A. M. Becker, H. A. Lemline, E. H. Ferguson.

New York—Hunt & West; capital stock, \$10,000; incorporators, B. R. Law, J. W. Collopy, Jr., E. Z. Parker.

Orangeburg, S. C.—Calhoun Garage; capital stock, \$5,000; incorporators, C. R. Culler, N. E. Sailey.

Philadelphia, Pa.—James L. Gibney Rubber Co.; capital stock, \$300,000; incorporators, J. L. Gibney, John, L. Gibney, J. S. Mack, T. F. Golden, G. B. Shearer, Jr.

Philadelphia, Pa.—Republic Motor Co.; capital stock, \$50,000; incorporators, V. P. brow Baker, S. S. Muzzey, Paul Guilfoil.

Philadelphia, Pa.—V. P. Padula Motor Co.; capital stock, \$50,000; incorporators, V. P. Padula, F. C. Bishop, G. M. Hubbard.

Peoria, Ill.—Jefferson Automobile Co.; capital stock, \$30,000; general agency and garage; incorporators, R. C. Uckena, F. E. Howlang, F. I. Archdale, W. G. Rounenberg, C. Howland.

Rochester, N. Y.—Lamay Mfg. Co.; capital stock, \$25,000; to manufacture motors, etc.; incorporators, A. B. Headley, P. E. Tucker, A. C. Lamay.

San Angelo, Tex.—S. L. Henderson Co.; capital stock, \$10,000; to deal in motor cars and conduct repair shop; incorporators, S. L. Henderson, J. S. Allison, G. S. Allison.

St. Louis, Mo.—Engine Starter Co.; capital stock, \$50,000; directors, G. Heitz, A. A. Elicks, George W. Owens, L. H. Mesker.

St. Louis, Mo.—Lewis Automobile Co.; capital stock, \$16,000; incorporators, J. D. Lewis, W. H. McLean, J. H. Jackson.

St. Louis, Mo.—Kaufmann Motor Truck Co.; capital stock, \$15,000; incorporators, E. Kaufmann, G. H. Muehling, N. J. Sadler.

Wellsville, W. Va.—Brooke Auto Co.; capital stock, \$10,000; incorporators, J. H. Scott, C. M. Magee, P. A. Chapman.

Wilmington, Del.—Auto Service and Supply Co.; capital stock, \$15,000; incorporators, F. A. Webb, B. I. Bothe, A. Hindle.